ROHRBACK COSASCO SYSTEMS

ULTRACORR®2

CORROSION MONITORING SYSTEM

User Manual

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Table of Contents

Chapter 1 Introduction 1

System Overview..... 1
System Diagram.....2
Major Components.....2
UST2 Transducer.....2
Signal Cabling.....3
Reading Point.....3
Ultracorr2 Instrument 3
Smart Phone.....4
Corrdata® II Software 4
Installation Toolkit.....4

Chapter 2 Specification 5

System.....5
Ultracorr2 Instrument.....6

Chapter 3 Location of Monitoring Points 9

Chapter 4 Transducer Connection and Signal Cabling 11

Cabling 11
Local Mount Junction Box 12

Chapter 5 Ultracorr2 Instrument 15

Unpacking 15
Battery Installation.....15

Chapter 6 Smartphone.....17

Key Features.....17
SmartPhone Software.....18
Windows Vista/Windows 7.....18
Windows Mobile Device Center.....18
Windows XP.....22
Microsoft ActiveSync.....22

Chapter 7 Smartphone/Ultracorr2 Configuration.....25

Smartphone & Ultracorr2 Communication.....25
Transducer Manual Reading.....27
Transducer Saving.....28
Ultracorr2 Test Mode.....28
Datalogger Mode.....29
Registered Devices.....30
Transducer Calibration.....31

Chapter 8 Transfer Readings from Ultracorr2 to the Corrdata® II.....33

Copying UC Files from SmartPhone to PC.....33
Run Corrdata II.....33

Chapter 9 Data Viewing on Ultracorr 2.....40

Appendix A Manufacturer's Declaration of Conformity.....43

CSA International (CSA) Certification 46
IEC Ex Certification - Ultracorr2 Ultrasonic Transmitter 49
IEC Ex Certification - UST2 Ultrasonic Transducer 54
ATEX Certification - Ultracorr2 Ultrasonic Transmitter 58
ATEX Certification - UST2 Ultrasonic Transducer.....62

Figures and Drawings

Figure Page

Figure 1.1 - System Overview.....2
Figure 1.2 - UST2 Transducer (Typical).....3
Figure 1.3 - Ultracorr2 Instrument.....4
Figure 1.4 - Smartphone (Typical).....4
Figure 2.1 - Ultracorr2 Instrument Specifications.....7
Figure 3.1 - Transducer Location.....9
Figure 4.1 - Weather Resistant Connector.....11
Figure 4.2 - Pole Mount Junction Box.....12
Figure 4.3 - Wall Mount Junction Box.....13
Figure 5.1 - Battery Cover of Ultracorr2 Instrument.....16

Introduction

CHAPTER 1

System Overview

The new Ultracorr2 is the next evolution in handheld Ultracorr Corrosion Monitoring Systems. Ultracorr2 provides a cost effective ultrasonic thickness measurement and temperature measurement of a pipe or vessel wall using fixed transducers mounted at various locations throughout a site.

After initial installation, access to the monitoring point is no longer required. The transducer connector can be located at a convenient location for taking thickness and temperature readings. These readings can then be downloaded to a personal computer running Corrdata II Corrosion Management Software for storage and trend analysis.

The Ultracorr2 transducers are equipped with an integral RTD measuring temperature which enables taking of simultaneous metal thickness and metal temperature readings. The instrument uses temperature data to compensate for changes in the metal thickness readings due to temperature variations. The new generation of transducers are embedded with smart sensors that retain user configured ID characteristics.

NOTE: THE CORROSION MONITORING INDUSTRY COMMONLY USES THE TERM "PROBE" TO REFER TO THE CORROSION MEASUREMENT SENSOR, WHICH COULD BE AN ULTRASONIC "PROBE". IN THE NON-DESTRUCTIVE TESTING INDUSTRY, IT IS COMMON TO SEE THE TERM ULTRASONIC TRANSDUCER USED. FOR THE PURPOSES OF THIS MANUAL, THESE TERMS ARE EQUIVALENT AND MAY BE USED INTERCHANGEABLY.

A basic system consists of a smart transducer, the new Ultracorr2 handheld instrument, data collection device, and Corrdata II Software package. Since it will often be advantageous to take a reading of the transducer from some remote point, there are numerous cabling options to connect these two items. For example, cables may be run from numerous transducers into a single junction box at ground level, where multiple readings may be taken very quickly.

Although there are many applications for the Ultracorr Corrosion Monitoring System, there are three basic system applications. Refer to chapter 4 and 5 for installation procedures for various placement options.

1. Above ground insulated pipelines or vessels.
2. Above ground uninsulated pipelines or vessels.
3. Below ground, buried pipelines or vessels.

Figure 1.1 - System Overview

System Diagram

Figure 1.1 illustrates a typical installation of the Ultracorr2 Corrosion Monitoring System. The major components are described below.

A UST2 Ultracorr Transducer
B Signal Cabling
C Reading Point
D Ultracorr2 Instrument
E Smartphone for control and data collection
F PC Running Corrdata II Software

Major Components

UST2 Ultracorr Transducer

The transducer (probe) is a small (1.2 inch diameter by 1.8 inch high) sensor which is permanently mounted to the monitoring point. This is accomplished using a special adhesive which also acts as an ultrasonic couplant. The transducer has a magnetic base to aid in holding it in position while the adhesive cures. The temperature sensor on the transducer allows for automatic correction of acoustic velocity as a result of the metal temperature. This provides a significantly more accurate reading of thickness. These newest generation transducers also have the capability of storing and transmitting location and configuration information to the Ulltracorr-2 instrument, for ease of operation and to eliminate operator errors.

NOTE: PREVIOUS GENERATION TRANSDUCERS ARE COMPATIBLE, BUT NOT HAZARDOUS RATED FOR USE WITH THE ULTRACORR2.

Figure 1.2 - UST2 Transducer (Typical)

Signal Cabling

Two types of cables are available to bring the reading point to a convenient location. For example, if a monitoring point is on a vessel 20 feet above the ground, then access to the monitoring point location is only required for the initial installation of the transducer. A cable may then be run from the transducer to a junction box located at ground level. Each installation must be evaluated for the proper type of cable installation. Standard cables have a weather resistant polyurethane jacket.

Reading Point

There are various options available for a remote reading site. For a location with a single monitoring point, the transducer cable is fitted with a weather resistant connector. An optional NEMA 4X junction box with provision for up to seven connectors is available. Larger junction boxes are also available. For underground applications, standard above ground or flush-with-grade monitoring locations are available.

Ultracorr2 Instrument

The Ultracorr2 instrument is the heart of the Ultracorr Corrosion Monitoring System. The intrinsically safe Class 1 Zone 1 rated, single Ultracorr2 instrument may be used to periodically take individual time and date stamped wall thickness, signal and temperature readings of up to 255 sensors. It will store up to 2000 readings for each of these sensors. Refer to Chapter 5 for more information.

Figure 1.3 - Ultracorr2 Instrument

Smartphone

The hazardous approved smart phone has two primary uses: One is to custom configure the Ultracorr2 Instrument which in turn will configure the UST2 smart transducer, and two is to allow for recent data from the Ultracorr2 Instrument to be collected from the Reading Point in the field. The smartphone has an easy to use application that interfaces with the Ultracorr2 instrument via Bluetooth communication. Once data has been saved onto the smart phone, the data can then be easily downloaded onto a PC for analysis with the Corrdata II Corrosion Management Software.

Figure 1.4 - Smartphone (Typical)

Corrdata II Software

The Corrdata II Corrosion Management Software is a powerful application that can perform various functions. The software can be used to compare and analyze data with graphing tools, while also allowing for data to be converted into a CSV (comma separated value) format if exporting into a spreadsheet program. The Corrdata II software can also integrate other data process parameters such as CORROSOMETER and CORRATER instruments. Refer to Transfer Readings from Smart Phone to the Corrdata II section for more information on transferring and analyzing data on a personal computer.

Installation Toolkit

Toolkits containing all the tools for uncoated and coated pipeline installations are available, or tools may be ordered on an individual basis. The toolkits contains such items as a cordless drill with a spare battery and charger, tools for paint removal and surface preparation, and the required epoxy to attach the transducer to the pipeline. Please contact RCS for further details.

Specifications

CHAPTER 2

Ultracorr2 Instrument

Battery Requirements:
2 x 3.6V AA Lithium Cells (RCS P/N 095820)

Battery Life:
Over 6000 readings

Operating Temperature:
-40°F to 158°F (-40°C to 70°C)

Storing Temperature:
-40°F to 158°F (-40°C to 70°C)

Dimensions:
6”H x 3.25”W x 1.25”D (152.4 mm x 82.55 mm x 31.75 mm)

Weight:
1 lb. (0.45 kg)

Intrinsic Safety rated for USA, Canada, and Europe:

For USA/Canada: Ex ib IIC T4: Class I, Zone 1 AEx ib IIC T4

For Europe: II 2G
Ex ib IIC T4 Gb
Ta = -40°C to +70°C

UST2 Ultrasonic Sensor

Thickness Measurement:

Range:	0.2 (0.1 for special orders) to 2.0 inches, up to 25 ft. cable
Resolution:	0.0001 inch
Accuracy:	± 0.0002 inch at constant temperature ± 0.0005 inch from -40°C to +70°C (Instrument) ± 0.0003 inch from -40°C to +150°C (Metal Surface of Transducer)

Transducer Temperature:

Range:	Ambient: -40°F to +158°F (-40°C to +70°C)
	Metal Surface: -40°F to +305°F (-40°C to +150°C)

Temperature Compensation:

-0.0002 inch/inch/°C

Temperature Differential Error:

-0.0001 inch/inch/°C difference (inside to outside of wall)

Temperature Measurement:

Range:	-40°C to +150°C
Resolution:	0.1°C
Accuracy:	±2°C (Transducer)
	±2°C (Instrument)

Data Storage:

Memory Type:	Nonvolatile
Probes:	255
Readings/Probes:	2000
	Time and Date Stamped

Interface:

Bluetooth®

Transducer Type:

Contact

Transducer Cable:

RG-174 up to 25 ft.

Hardware Supplied:

- Ultracorr2 Instrument
- 2 AA Lithium batteries
- CD-ROM or Flash Drive

Software Supplied:

- Ultracorr2 Corrosion Monitoring System User Manual
- Window XP/Window7/Windows Drivers
- Corrdata II Corrosion Management Software

Figure 2.1 Ultracorr2 Instrument Specifications

Location of Monitoring Points

CHAPTER 3

The small size of the transducer allows it to be mounted almost anywhere. The only requirement is a two inch diameter area of clean metal. Some of the factors to consider when selecting a monitoring point include:

- Access must be provided to the monitoring point for the initial transducer installation. After installation, access to the monitoring point is not required.
- Insulated vessels must have the insulation removed at the monitoring point. An access port can be installed at that location.
- Generally, the most cost effective installation is the shortest cable run to the most convenient and safe man access to the test station.

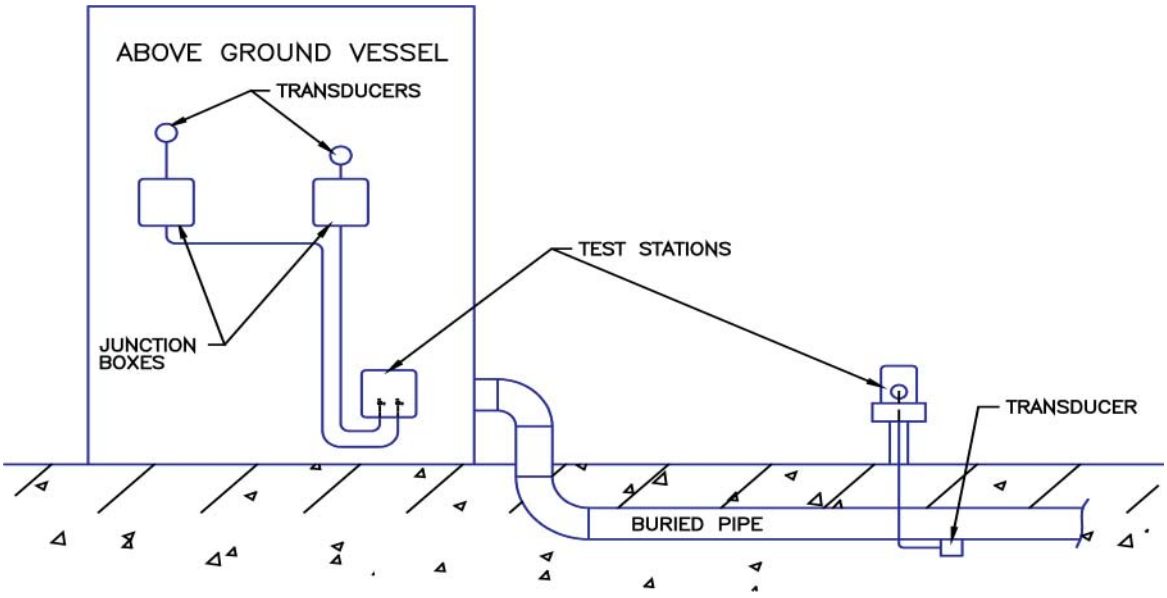


Figure 3.1 - Transducer Location

Transducer Connection and Signal Cabling

CHAPTER 4

Cabling

The standard transducer is fitted with a weather resistant connector (see figure 4.1). This connector is suitable for outdoor environments, and therefore can be left at a convenient reading point without any further protection. If required, cable can be run through conduit to its desired location. Conduit must be 1-1/4” or larger, to accommodate the 1.25” diameter connector housing.

Two types of cable are available. The standard has a thick, black polyurethane outer jacket, and is suitable for most environments. For more severe applications, this same cable is available with a braided, stainless steel armor jacket.

Figure 4.1 - Weather Resistant Connector

Local Mount Junction Box

An alternative to leaving the connector exposed is to mount one or more connectors inside a NEMA 4X box. There are several advantages to doing this, including additional protection, security, and the ability to run multiple connections to a single point for rapid measurements.

Two standard box configurations are available. RCS part number 744014 is designed to mount on a two inch pipe and has provisions for up to 7 transducer connectors (see figure 4.2). This configuration is particularly suitable for buried pipeline applications, as the cables can be run from the buried pipe, through the 2" supporting pipe and into the box.

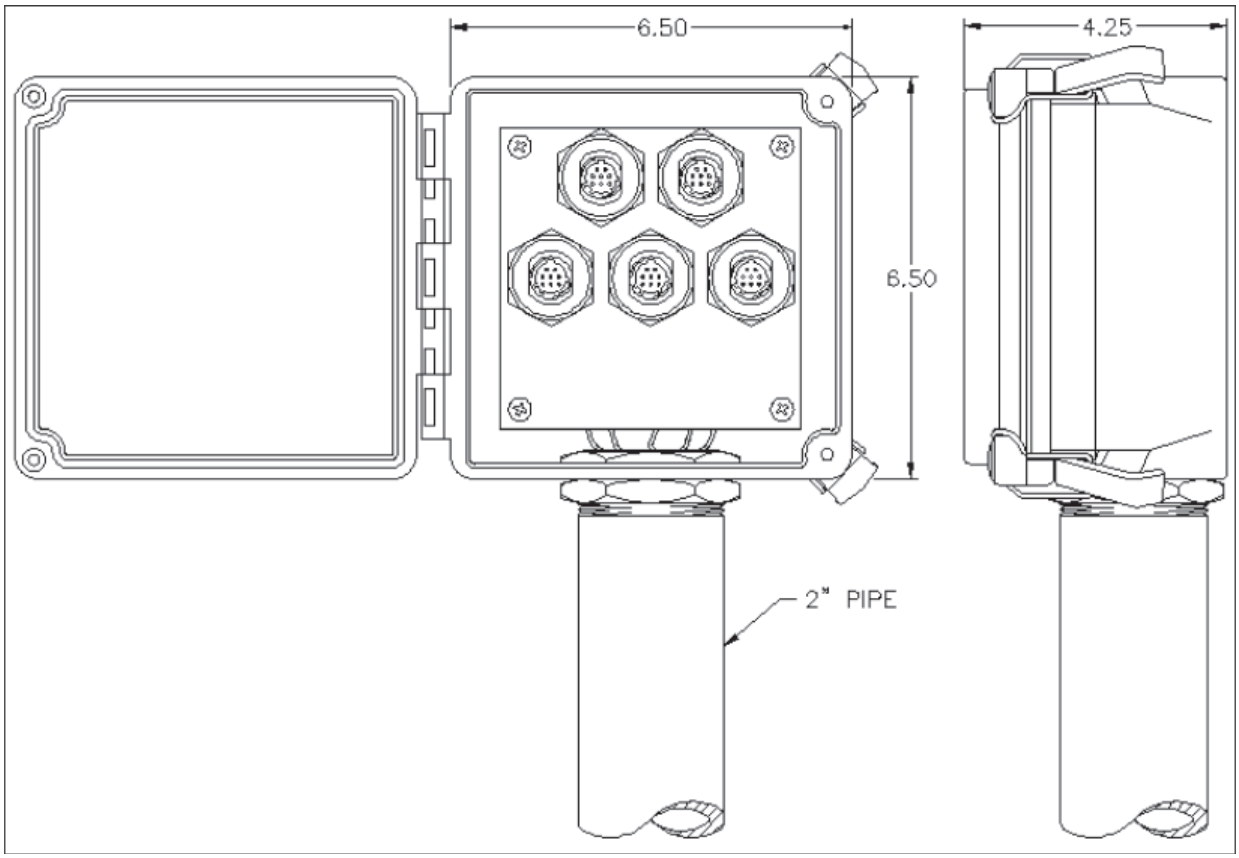


Figure 4.2 - Pole Mount Junction Box

RCS part number 744017 is the same size box, but is configured for the transducer connectors to mount on the bottom of the box. Mounting ears are provided on the box for wall or pole mounting. This box may be more suitable for above ground transducer applications (see figure 4.3).

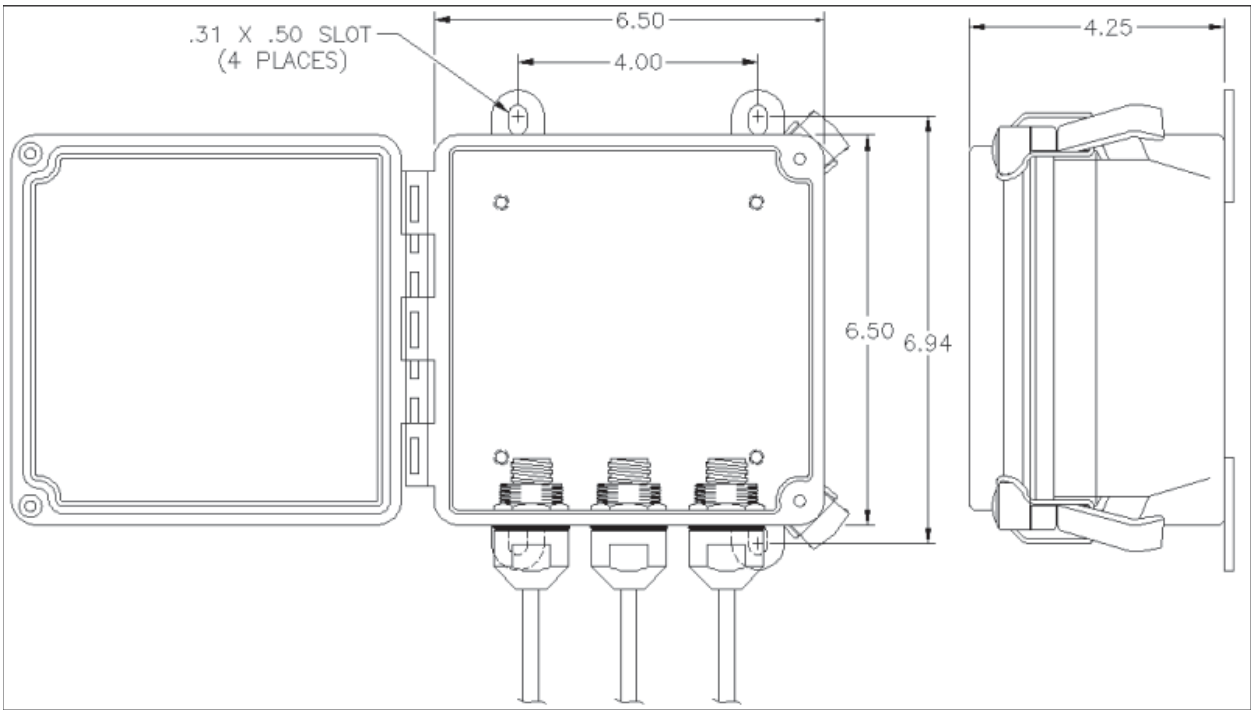


Figure 4.3 - Wall Mount Junction Box

Ultracorr®2 Instrument

CHAPTER 5

The intrinsically safe, Class I, Zone I rated Ultracorr2 utilizes high sensitivity ultrasonic technology to provide **nonintrusive**, cost effective monitoring of corrosion and erosion. The instrument can be used to provide periodic time and date stamped measurements of wall thickness and temperature of up-to 50 transducers. The thickness and temperature data can then be downloaded to a personal computer running Corrdata II Corrosion Management Software for storage and trend analysis.

NOTE: EACH ULTRACORR2 INSTRUMENT IS CAREFULLY TESTED, INSPECTED AND PACKAGED PRIOR TO SHIPMENT. BEFORE UNPACKING THE INSTRUMENT, PLEASE INSPECT THE PACKAGED MATERIALS FOR SHIPPING DAMAGE AND RETAIN ALL DAMAGED PACKAGED MATERIALS TO SUPPORT ANY CLAIM AGAINST YOUR FREIGHT CARRIER SHOULD THIS BECOME NECESSARY.

Unpacking

Carefully remove the instrument from its package. Included in the package you should find:

- Handheld Ultracorr2 instrument
- USB with Ultracorr2 Corrosion Monitoring System User Manual, and Corrdata II Corrosion Management Software and User Manual
- 2 AA Lithium batteries

Battery Installation

The Ultracorr2 is supplied with a set of two 3.6 Volt lithium batteries (RCS PN 095820). To install these batteries, remove the access panel on the back of the unit (see below) and install the batteries with the polarities as indicated on the unit. Replace the back cover when finished.

Figure 5.1 - Battery Cover of Ultracorr2 Instrument

Smartphone

CHAPTER 6

The Smartphone is the essential wireless shuttle that will allow the Ultracorr2 Instrument to transmit all relevant information from the UST2 probes in the field on to a PC. The Smartphone is more unique than your average multi-band phone. It's rugged makeup can be operated in explosion hazardous areas rated up to Class I, Zone 2, or Class I, Zone I for North American certified smart phones. The phone is also Dustproof and Waterproof with an IP 65 rating. The phone has the capabilities of using various Microsoft Windows applications because of its Windows Mobile 6.5 Operating System. The Smartphone is user friendly and allows a user to use Bluetooth to download and store a large amount of data quickly from many UST2 locations and transfer all your data back to a PC via micro USB cable or Bluetooth.

NOTE: PHONE MODEL MAY VARY DEPENDING ON LOCATION OF USE AND HAZARDOUS REQUIREMENTS

Key Features

- UL/CSA Class I, Zone I and Zone 2 (for North America)
- ATEX Hazardous Rated Class I, Zone 2
- Dustproof and Waterproof (IP 65)
- Touch Screen
- GPS/Wi-Fi/Bluetooth
- Compatible with Windows XP/Windows Vista/Windows 7

Smartphone Software

In many cases, the following steps will not be needed to begin functioning the Smartphone with the Ultracorr2 system because the phone will likely be pre-configured by Rohrback Cosasco Systems for the customer to turn on and begin use. In the event that a smartphone needs to be restored with a fresh installation of Ultracorr2 software, the following instructions will guide you through proper software installation. The main thing to consider is which operating system you will be running in order to properly run the appropriate software. Please note, some windows geniune authentication may be required in order to run the installation software.

Windows Vista/Windows 7/ Windows 8

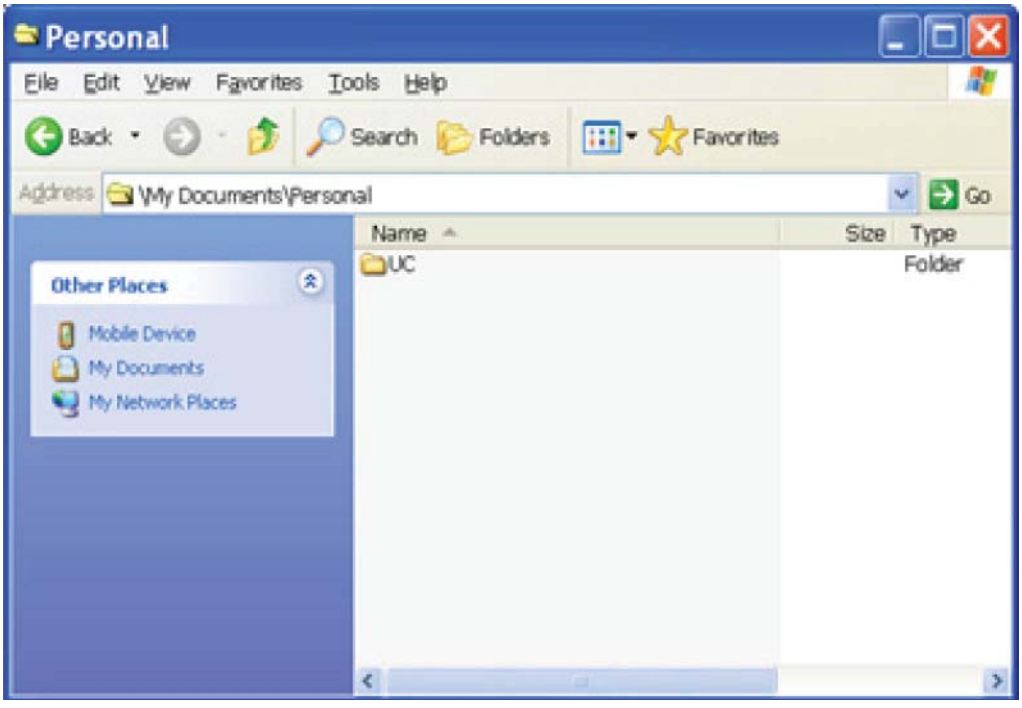
For systems using Windows Vista/7, likely Windows Mobile Device Center will be included within the operating system and everything should run seamlessly once your smartphone is connected to the PC. If not, files have been provided on an RCS USB Flash drive to install the appropriate drivers for the operating system you use.

Windows Mobile Device Center

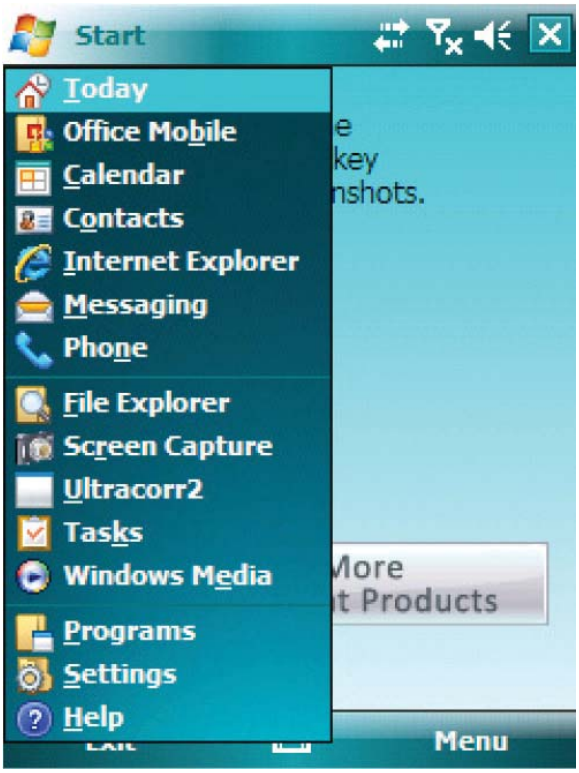
The following screens will guide you through proper installation:

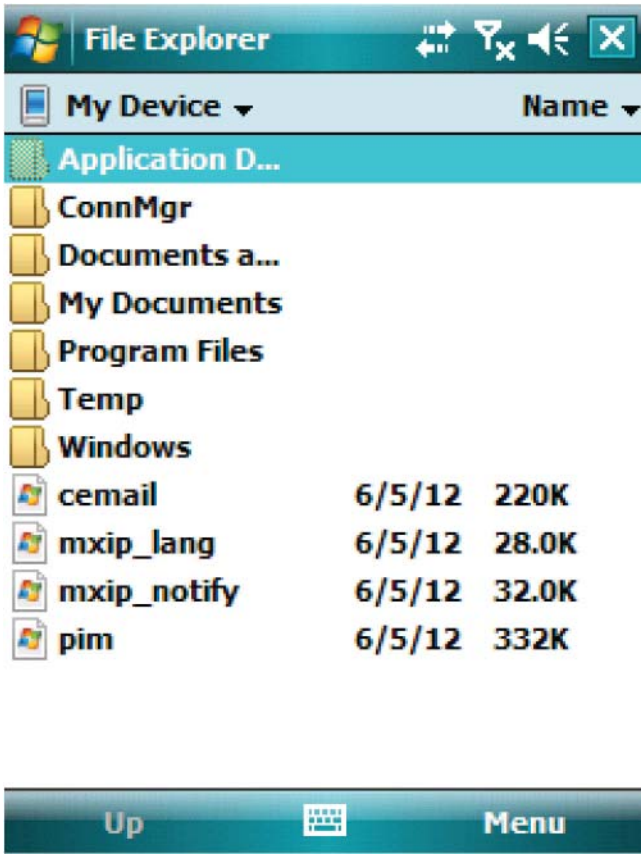
Connect without setting up your device

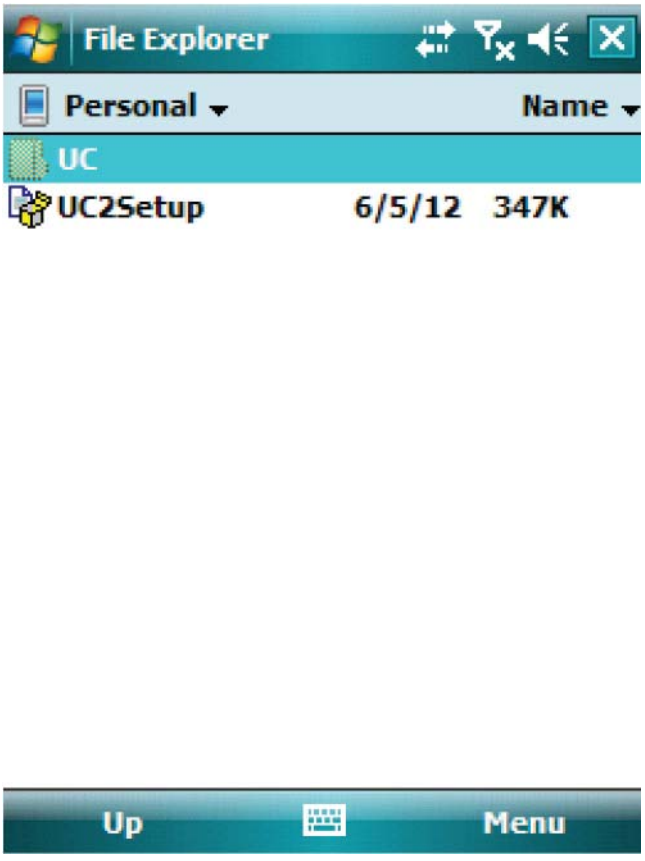
Browse the content of your device



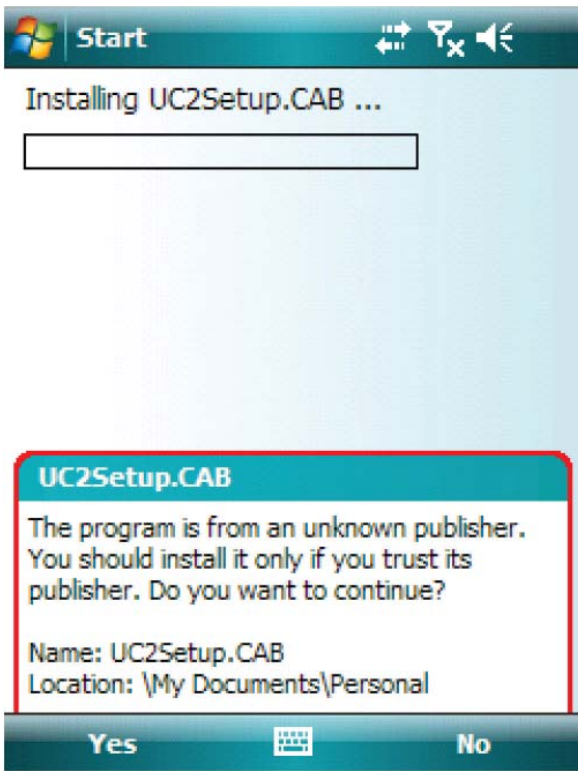
Explore directory \My Documents\Personal\UC
Copy the Ultracorr2 distribution package from the RCS Flash Drive into this directory

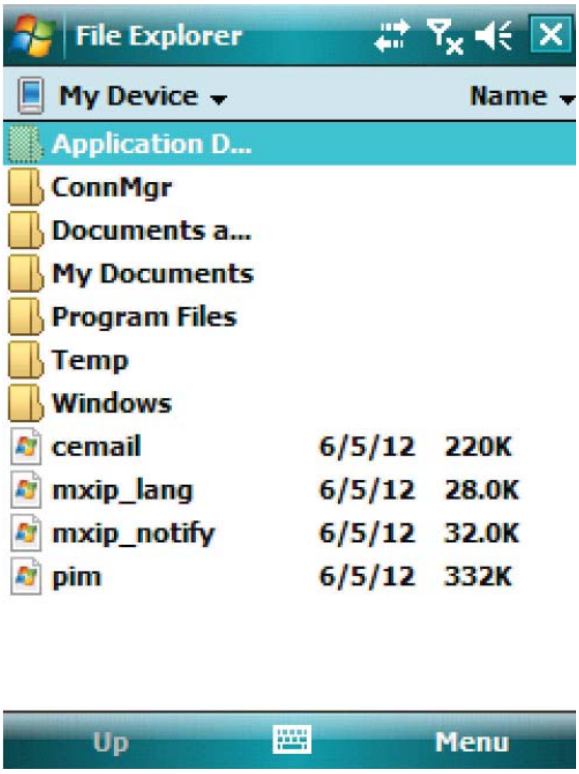


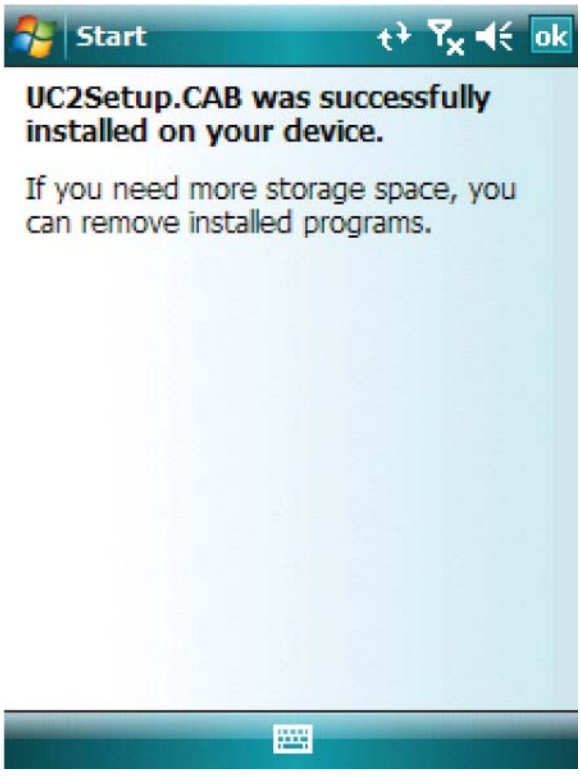


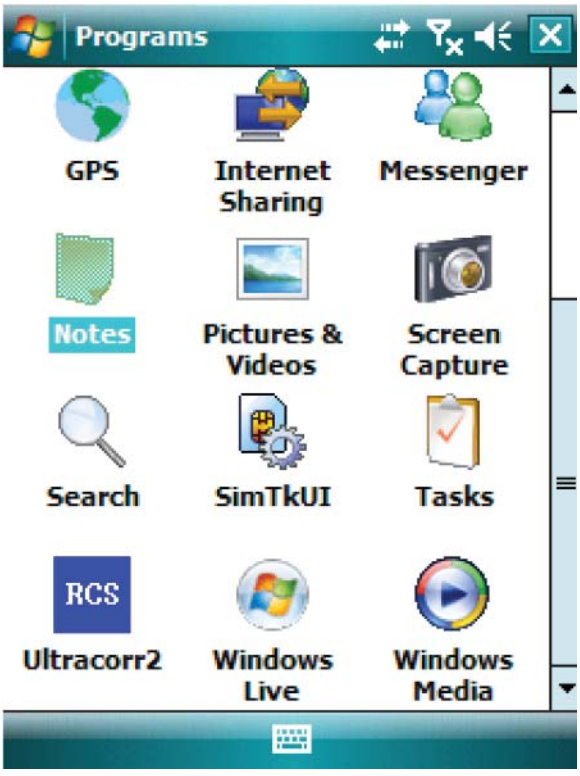


Start the Explorer on the mobile computer and navigate to My Documents\Personal and Click Installation file “UC2Setup to begin Installation.


Start
Installing UC2Setup.CAB ...
UC2Setup.CAB
The program is from an unknown publisher. You should install it only if you trust its publisher. Do you want to continue?
Name: UC2Setup.CAB
Location: \My Documents\Personal
Yes
No




Start
ok
UC2Setup.CAB was successfully installed on your device.
If you need more storage space, you can remove installed programs.



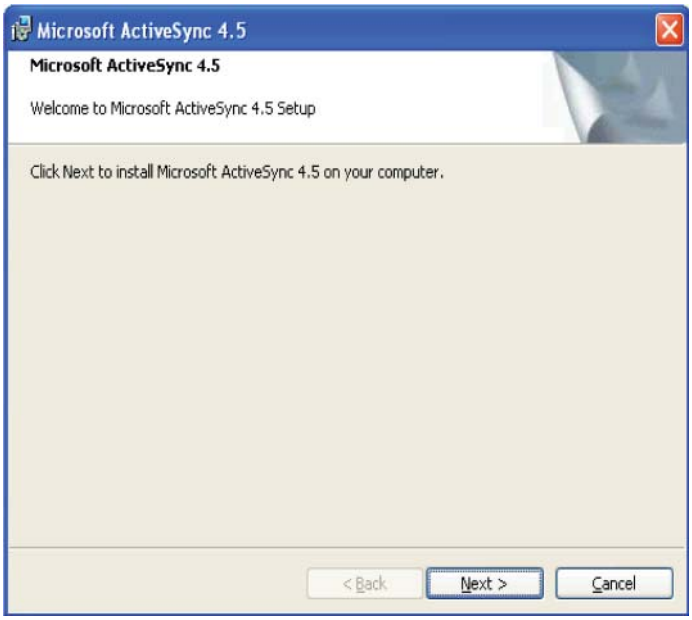
Once installation is complete, the RCS Ultracorr2 icon will appear in the file explorer.

Windows XP

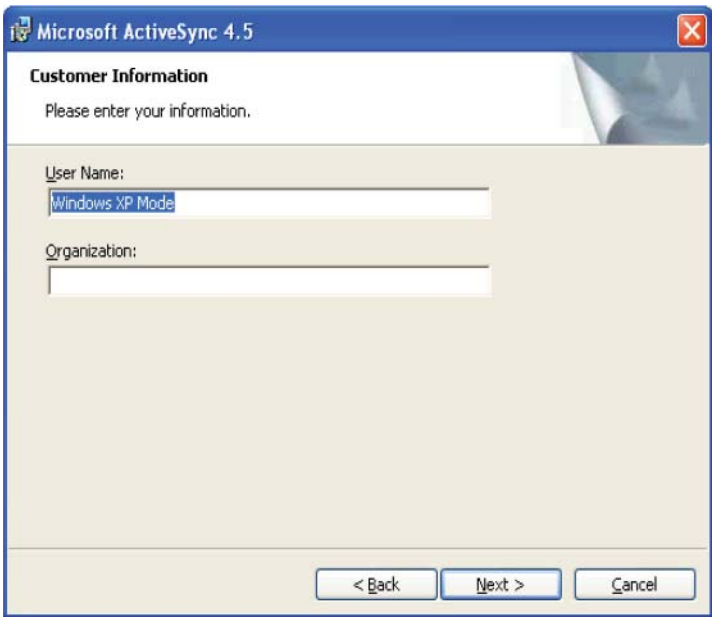
For Windows XP users, there is a two step process to accessing the phone file explorer and running the Ultracorr2 software. Step one, install the provided Microsoft Activesync software on to the PC. Step two, plug in your phone via USB cable and allow for Activesync to detect and install the appropriate drivers.

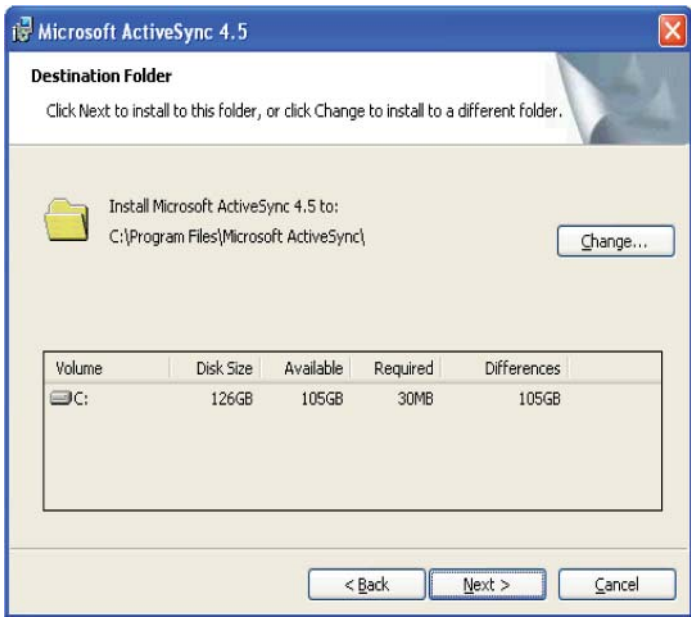
Microsoft ActiveSync

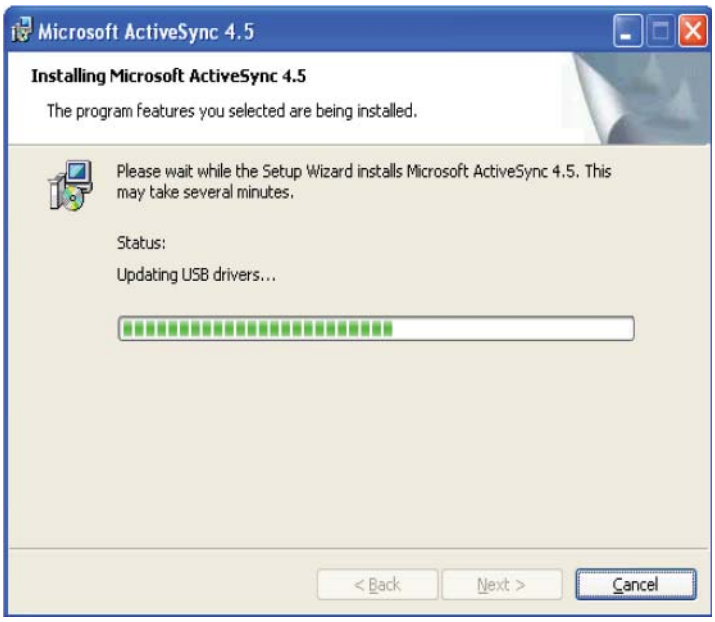
The following screens will guide you through the installation process:

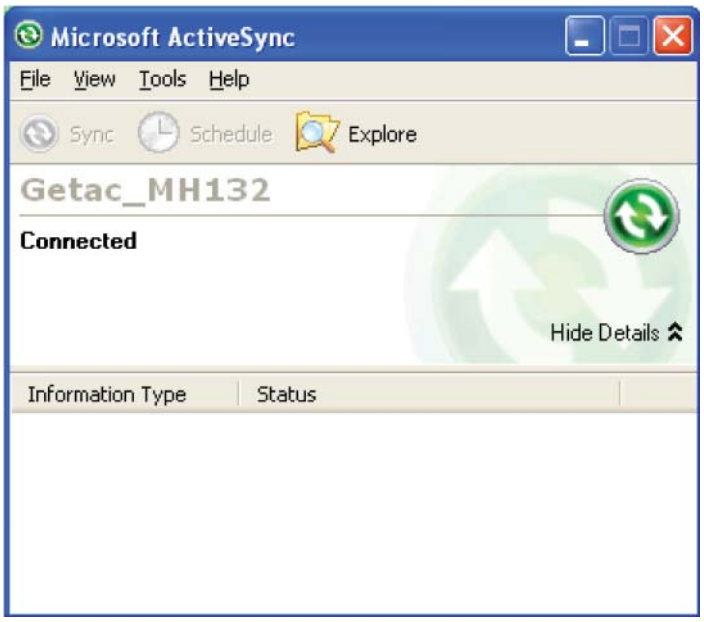

Microsoft ActiveSync 4.5
Microsoft ActiveSync 4.5
Welcome to Microsoft ActiveSync 4.5 Setup
Click Next to install Microsoft ActiveSync 4.5 on your computer.
< Back
Next >
Cancel

Microsoft ActiveSync 4.5
License Agreement
Please read the following license agreement carefully.
MICROSOFT SOFTWARE LICENSE TERMS
MICROSOFT ACTIVESYNC 4.5
These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
< Back
Next >
Cancel






Microsoft ActiveSync 4.5
Installing Microsoft ActiveSync 4.5
The program features you selected are being installed.
Please wait while the Setup Wizard installs Microsoft ActiveSync 4.5. This may take several minutes.
Status:
Updating USB drivers...
< Back
Next >
Cancel



Once ActiveSync has been completely installed, connect the Smartphone to the PC and wait for ActiveSync to install the appropriate drivers. The phone should automatically be detected, and steps should be repeated from pages 19-21, in order to have Ultracorr2 functional on the Smartphone.

Smartphone/Ultracorr-2 Configuration

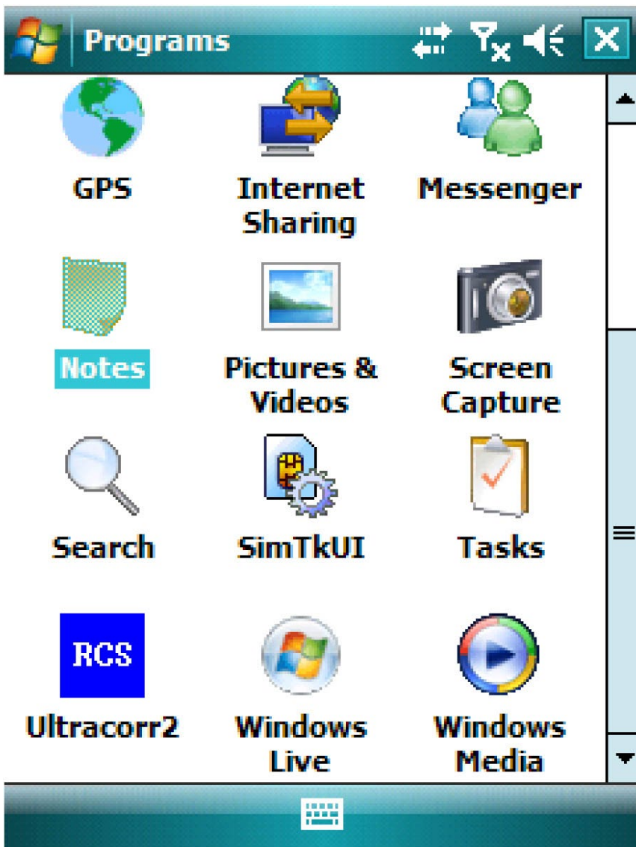
CHAPTER 7

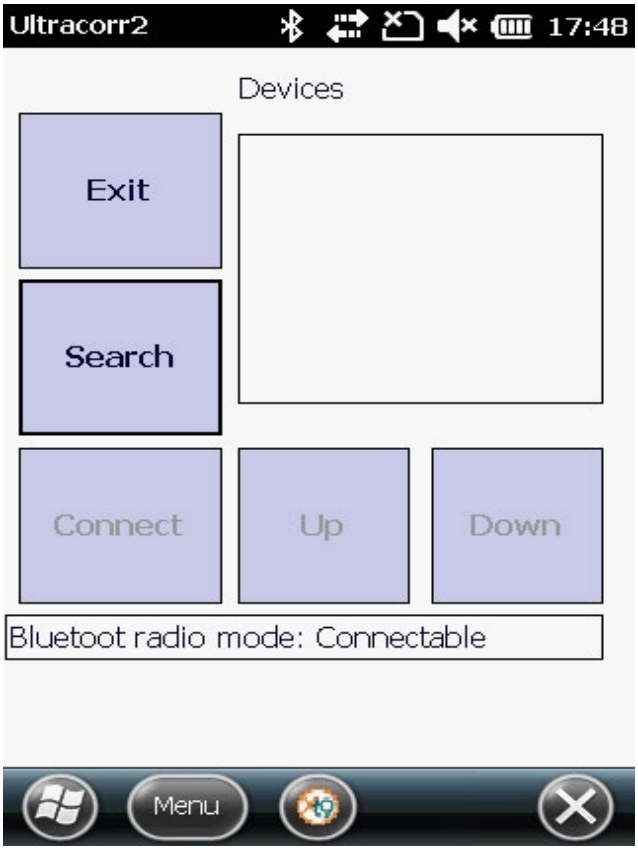
This chapter covers the various steps involved in Ultracorr2 communications and functionality testing. In order to successfully test the instrument, the Smartphone must be charged with bluetooth active and Ultracorr2 software installed. Also, the UST2 probe must be connected to the Ultracorr2 Instrument.

Smartphone & Ultracorr2 Communication

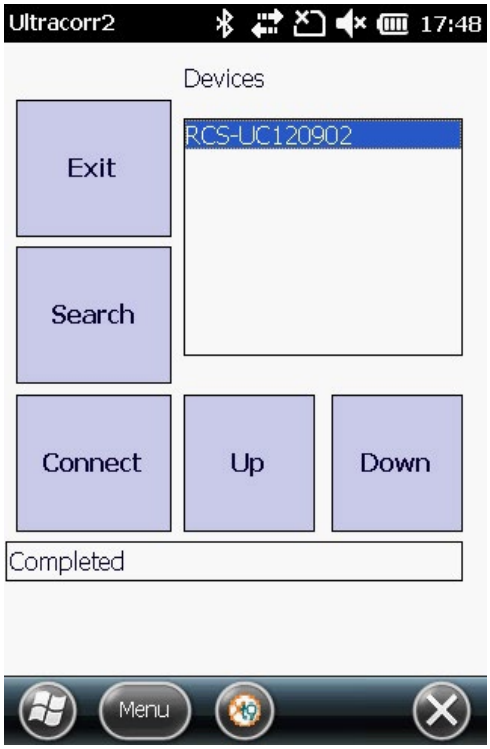
NOTE: PROBE TO ULTRACORR2 MUST BE CONNECTED!

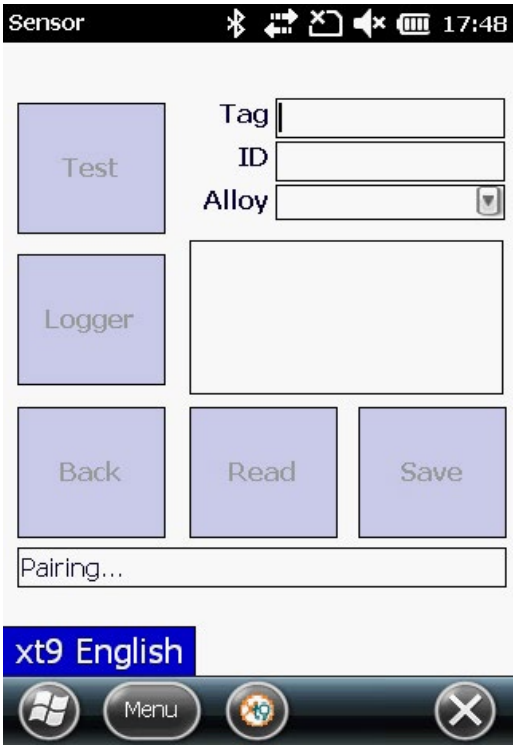
- Run the Ultracorr 2 application on your Windows Mobile Smartphone.



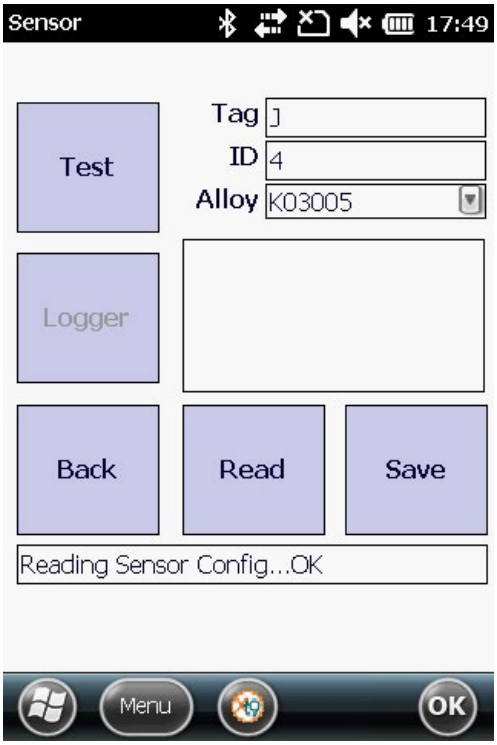


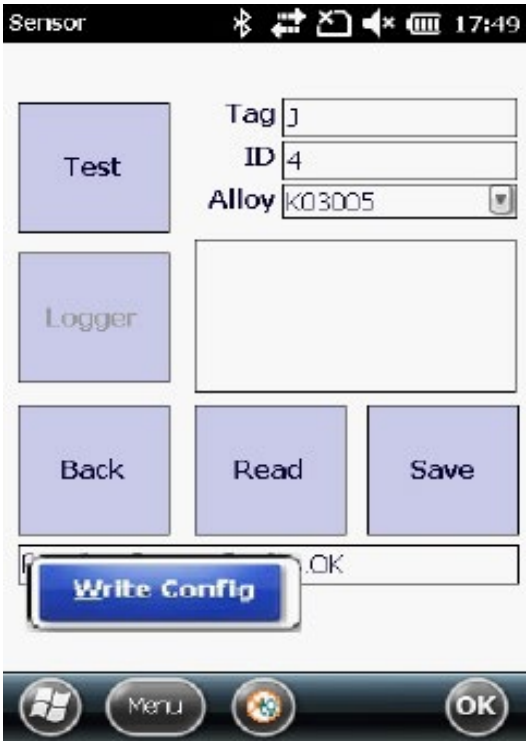
- Click the **Search** button to search for a device that's in range and wait 10 seconds. If a device is not found but connected correctly, search again before attempting to do further troubleshooting.





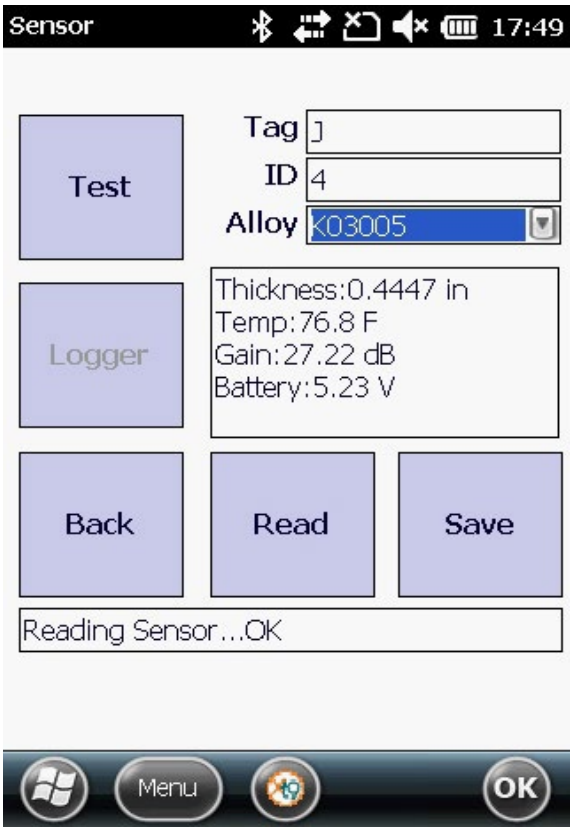
- Connect to Device and pairing will begin automatically. The pairing will retrieve all relevant information from the smart transducer which is connected to the Ultracorr2.





- The standard RCS configurations read from the transducer are Tag name, ID, and Alloy type.Once a configuration is changed, you MUST click Menu and Write Configuration to save. To edit Tag or ID fields, click the T9 icon to activate the virtual keyboard.
  Note: Keyboard and OK buttons on bottom menu are Windows Mobile buttons!

Transducer Manual Reading

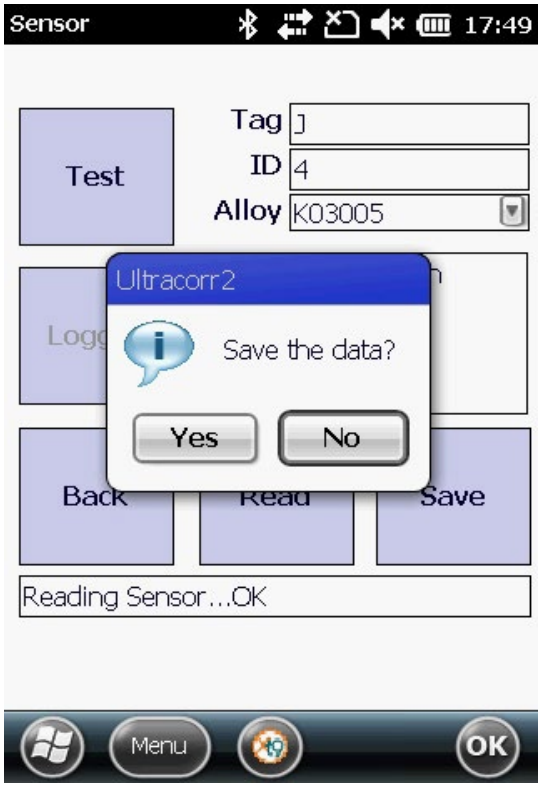


- To read the transducer, click **Read** to acquire the Thickness measurement, Temperature, Gain, and Battery level.

  NOTE: TRANSDUCER MUST BE PROPERLY CONNECTED TO THE PIPE BEFORE READING THE PROBE, THE BETTER THE CONNECTION, THE MORE ACCURATE THE READING!

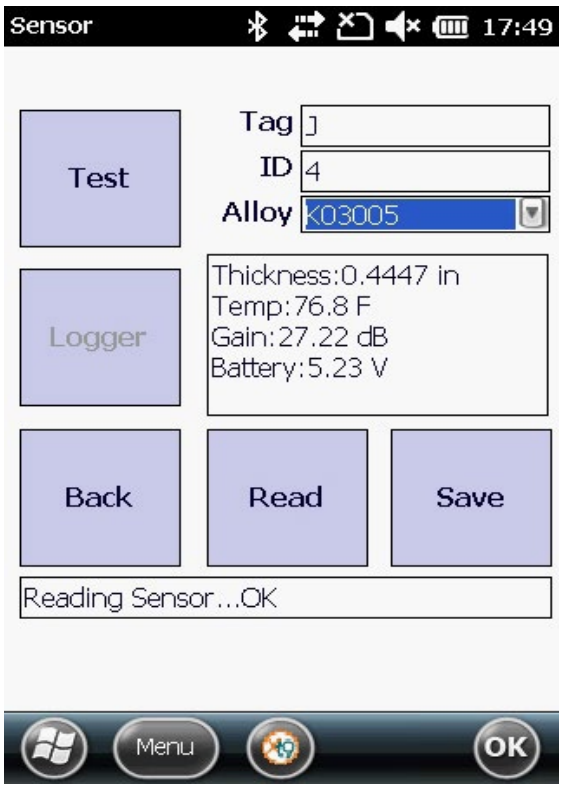
- Readings that have a higher dB gain will have less accurate thickness measurements. As a rule of thumb, anything above 40dB should be re-calibrated. Ways of getting a better reading are by sanding down the surface of the pipe more or adjusting the transducer mating.

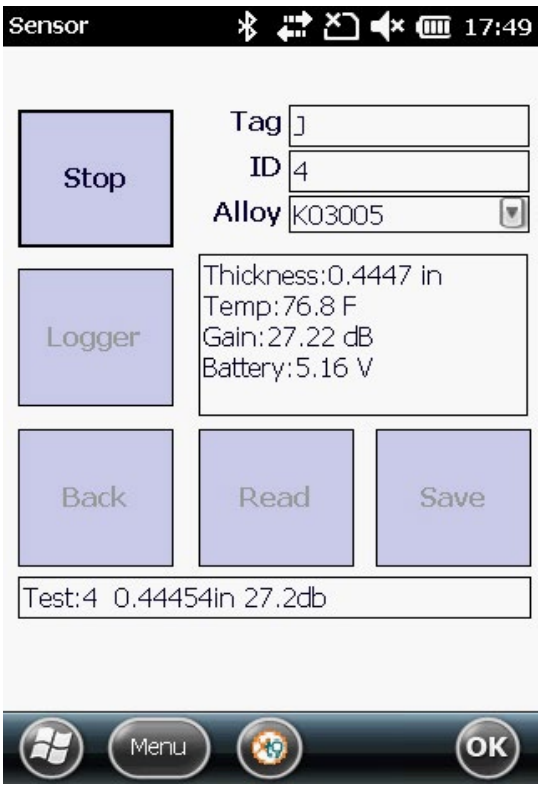
Transducer Saving



- To save a reading, click the **Save** button to save the most recent reading of that probe.

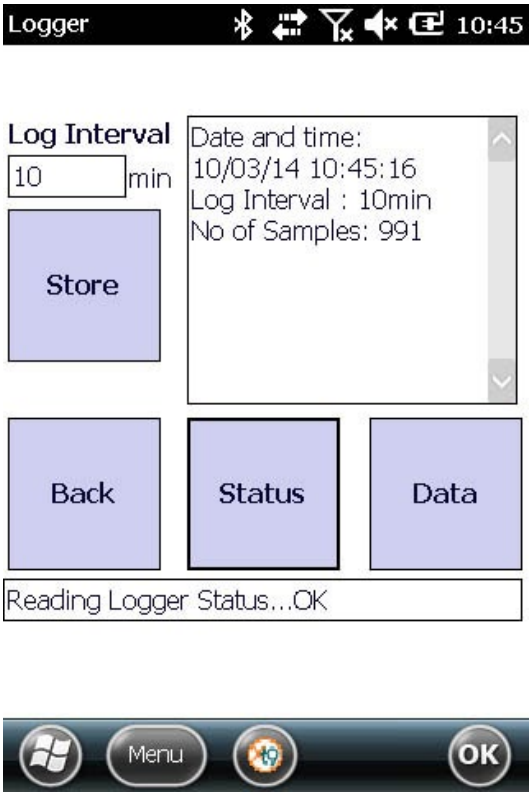
Ultracorr2 Test Mode

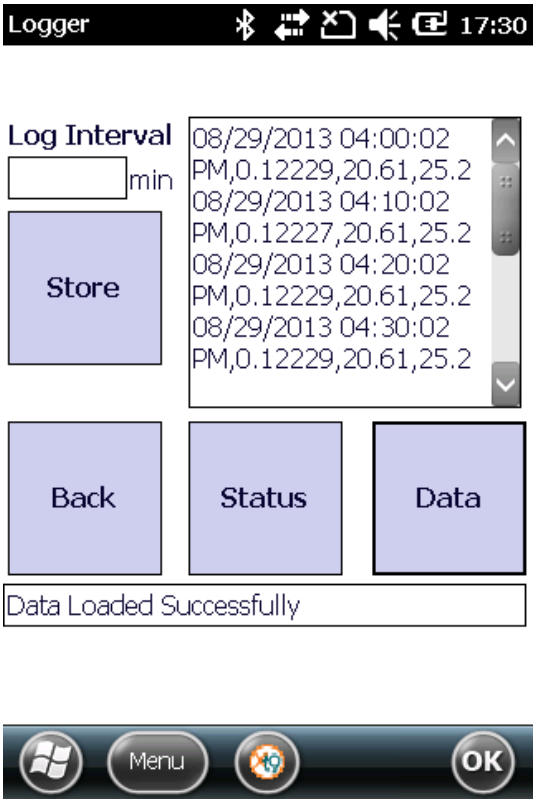




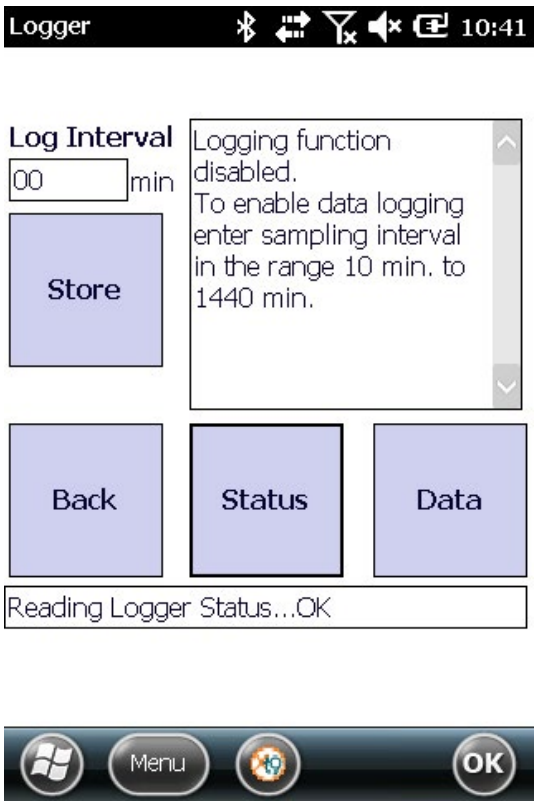
- To do continuous testing, click the **Test** button to continuously take measurements every second.

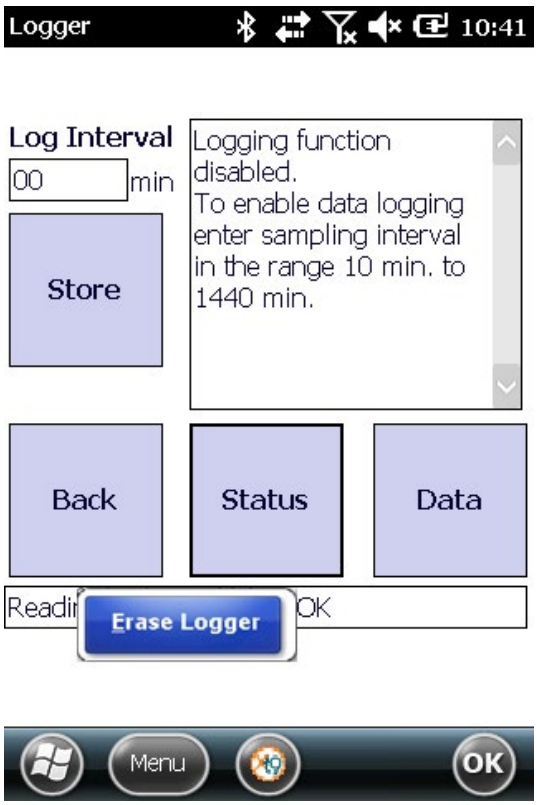
Datalogger Mode





- Click **Logger** to access Datalogger Mode. Click **Data** to Download all the data to the Phone.





- Type “00” to disable **Logger.** To enable **Logger**, enter a value between 10-1440 minutes and click **Store.** To erase all data, click **Menu, Erase Logger.**.

Registered Devices

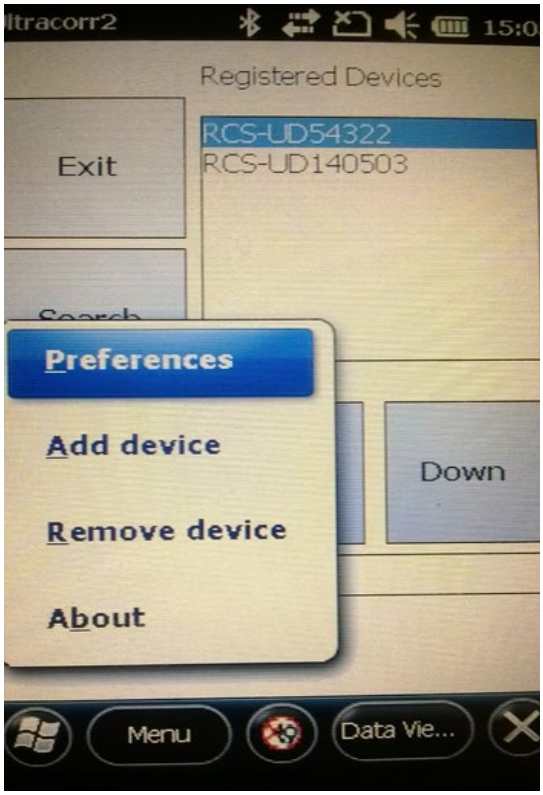
The Ultracorr 2 software allows users to register or unregister an Ultracorr 2 device. This tool allows for by passing the search command and directly connecting to a known device.

Registering New Device:

Simply click on “Add Device” to add a new device after it has been discovered. The new addition will be permenantly stored on the phone.

Unregistering Device:

Simply click on the “Remove Device” button to remove from the preferred device list.



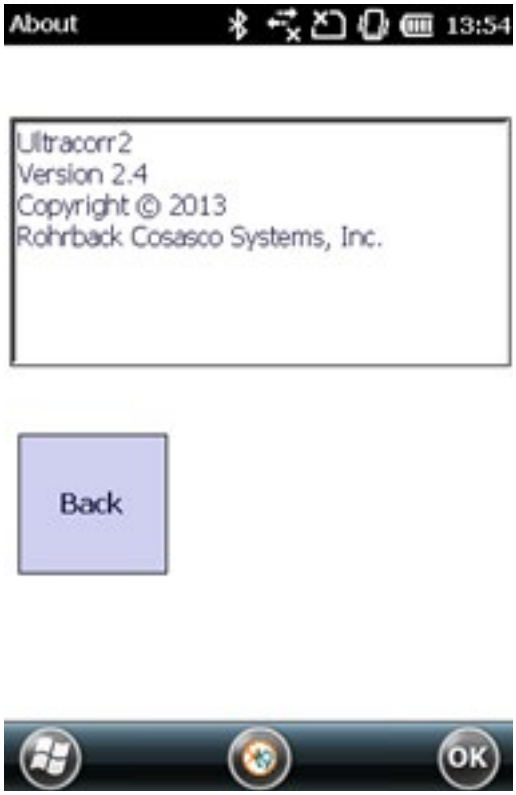
Once a device is registered, the application can connect to an Ultracorr 2 instrument directly.

Transducer Calibration

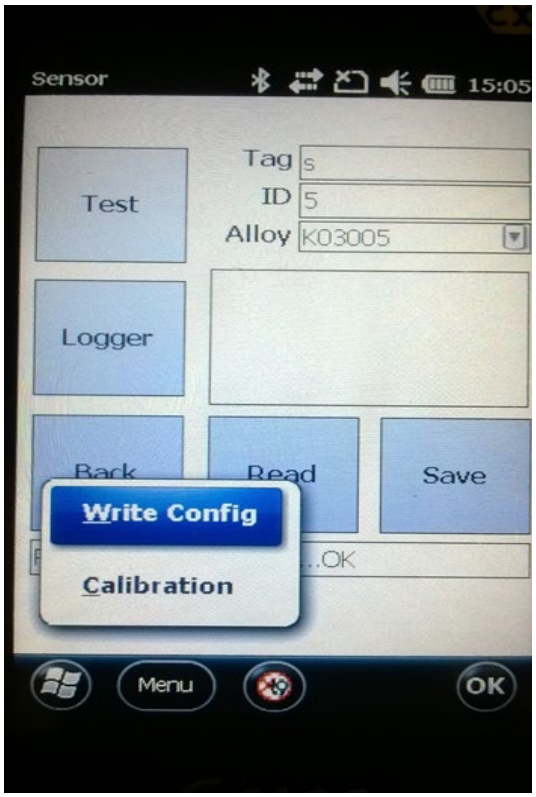
Transducers are pre-calibrated before being shipped to a customer. NOTE: **DO NOT** attempt to calibrate a transducer without notifying RCS. In most cases your transducer will not require a field calibration.

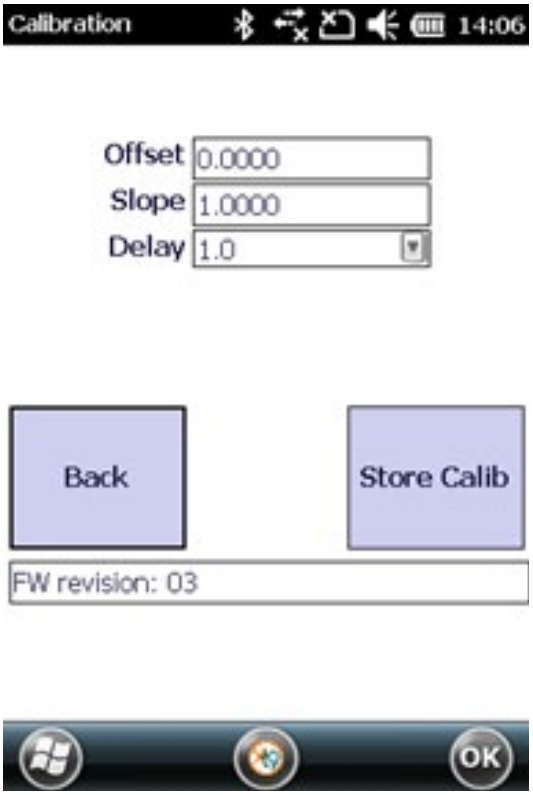
If transducer calibration is required, please contact your closest RCS regional office location for assistance. Information on the latest software version will be required.

- To confirm the latest software revision press **Menu**>**About**



- To Access the transducer's calibration parameters press **Menu > Calibration**





To contact RCS technical support go to: **technicalsupport@cosasco.com**
or call toll free **1-800-635-6898**

Transfer Readings from Ultracorr®2 to the CORRDATA II

CHAPTER 8

The most recent reading for any probe may be displayed on the Ultracorr2 Smartphone. For maximum functionality and data management, all the data contained in the smartphone may be downloaded to a personal computer running Corrdata II Corrosion Management Software package. The Corrdata II package is a flexible corrosion data management system that allows integration of all corrosion monitoring parameters. Refer to the Corrdata II Corrosion Management Software documentation for installation, site setup, capabilities and other details.

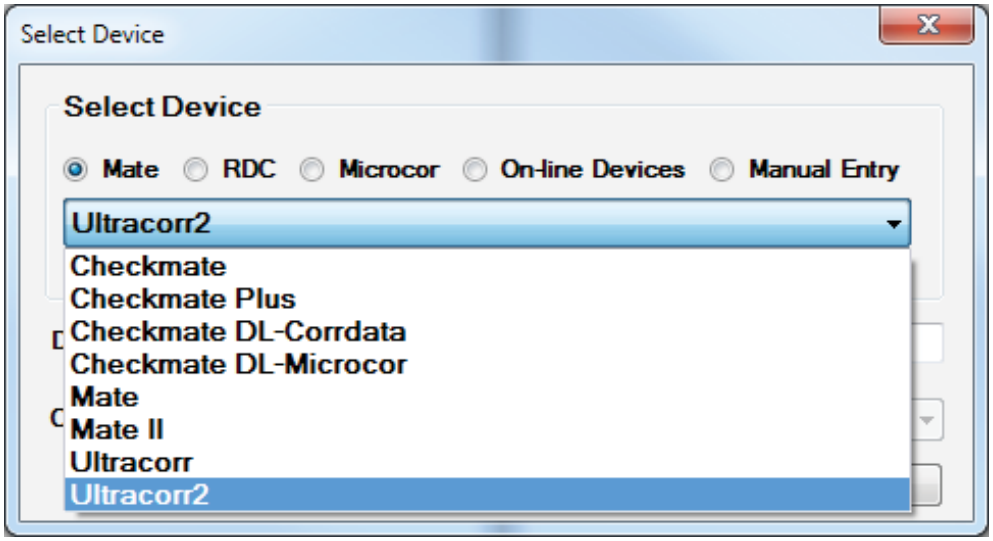
Copying UC Files from SmartPhone to PC

Once phone is connected to PC, browse the phone and copy the My Documents\Personal\UC directory to a known location on the local PC hard drive. This will avoid possible data corruption when importing from the PC, rather than directly from the SmartPhone.

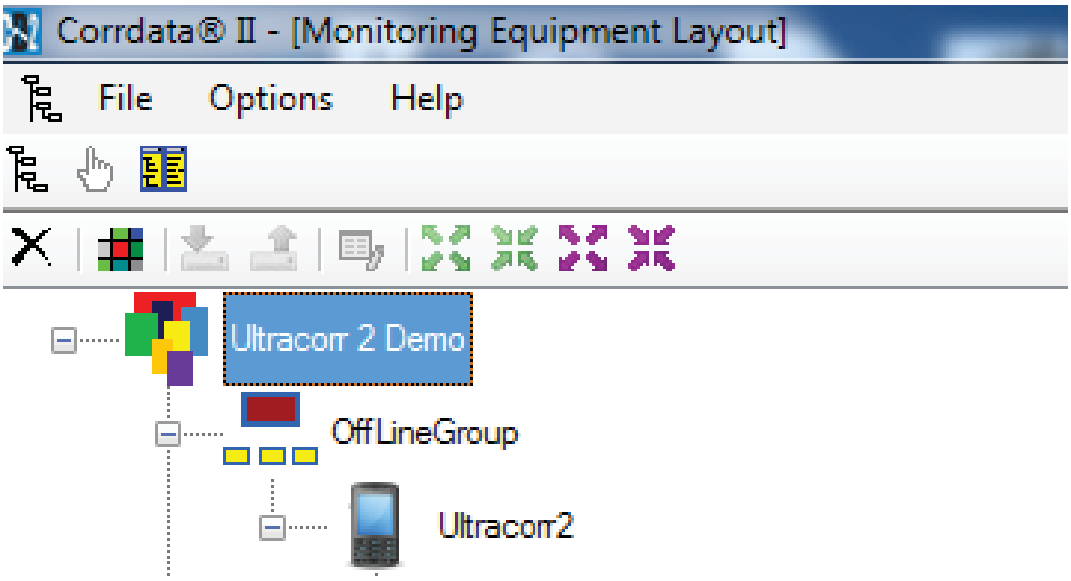
Run Corrdata II

After a database has been created, click on Equipment Layout + Selection Tool Icon. Follow instructions below to add the Ultracorr2 Points.

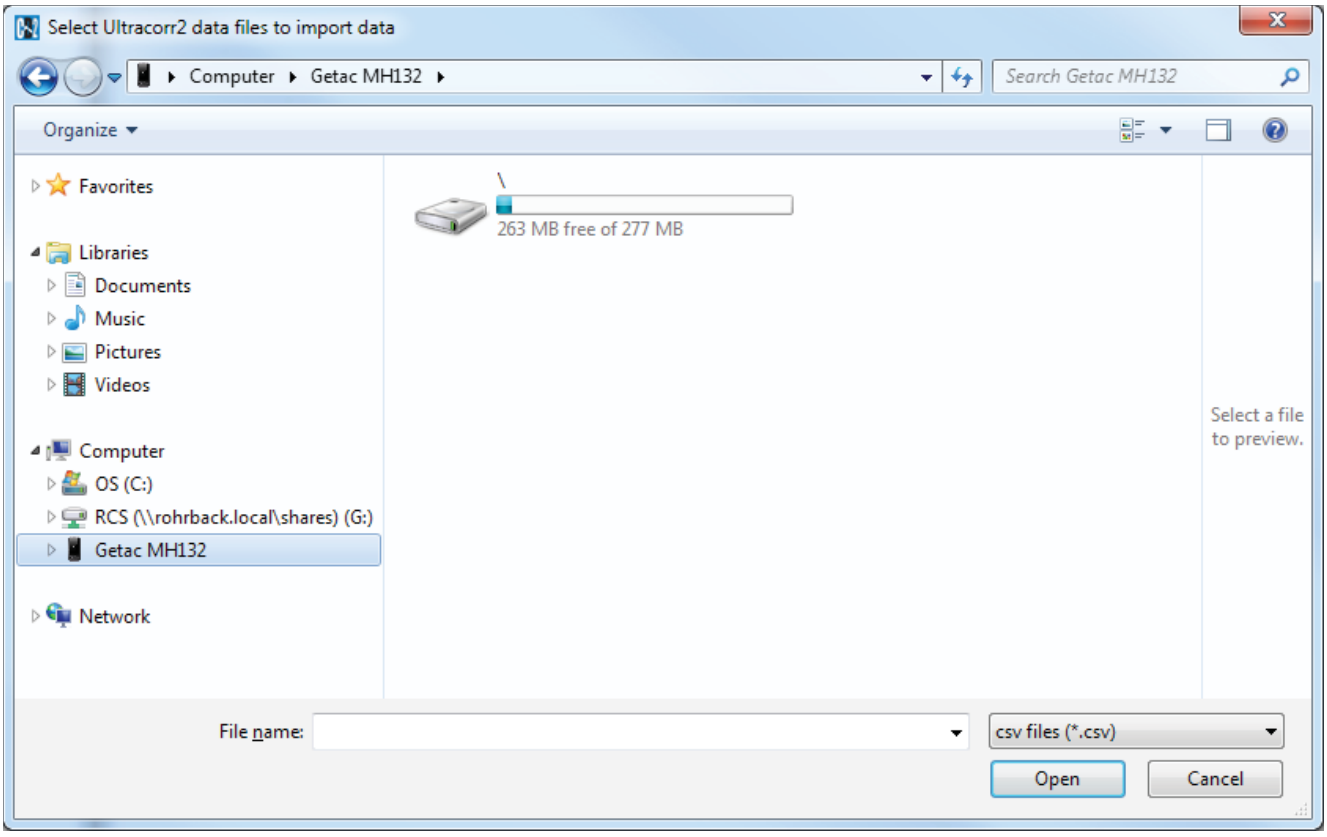
1. Click Item Palette Icon to add Instument
2. Add System by dragging System Icon onto Equipment Layout. (Adding offline sub-system is optional.
3. Add Device by dragging Device Icon onto System
4. Select Mate then click on Ultracorr2 as shown below

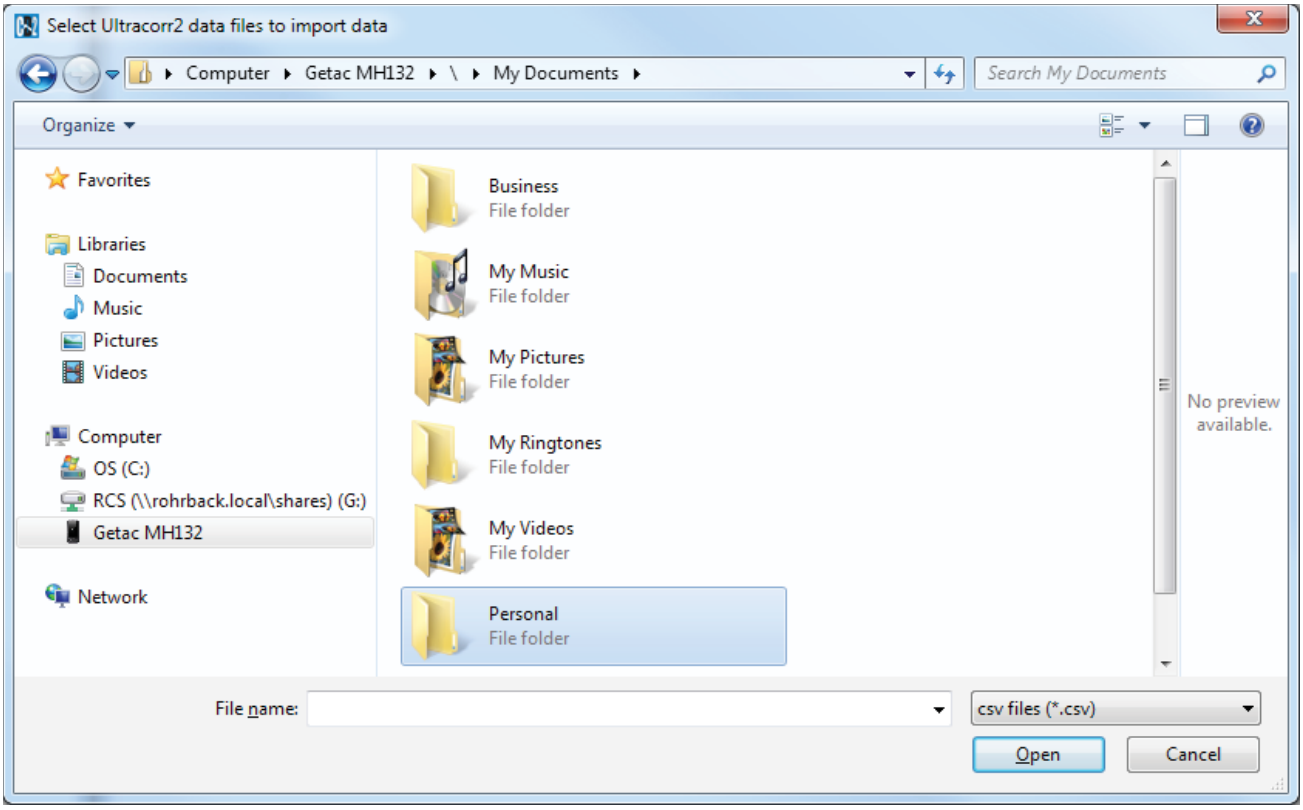


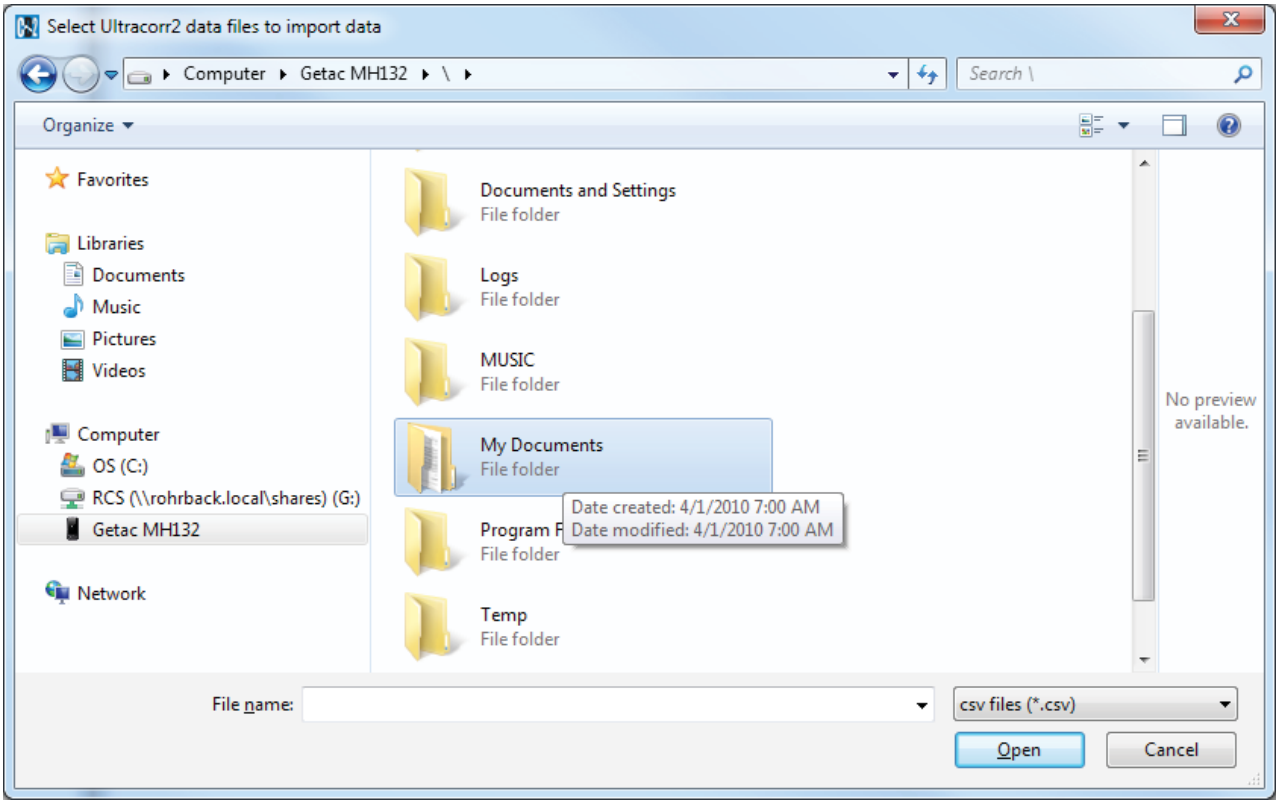
5. Ultracorr2 Phone will be displayed. Highlight Ultracorr 2 phone and click on green downwards arrow Icon that allows to Import Ultracorr2 Data.

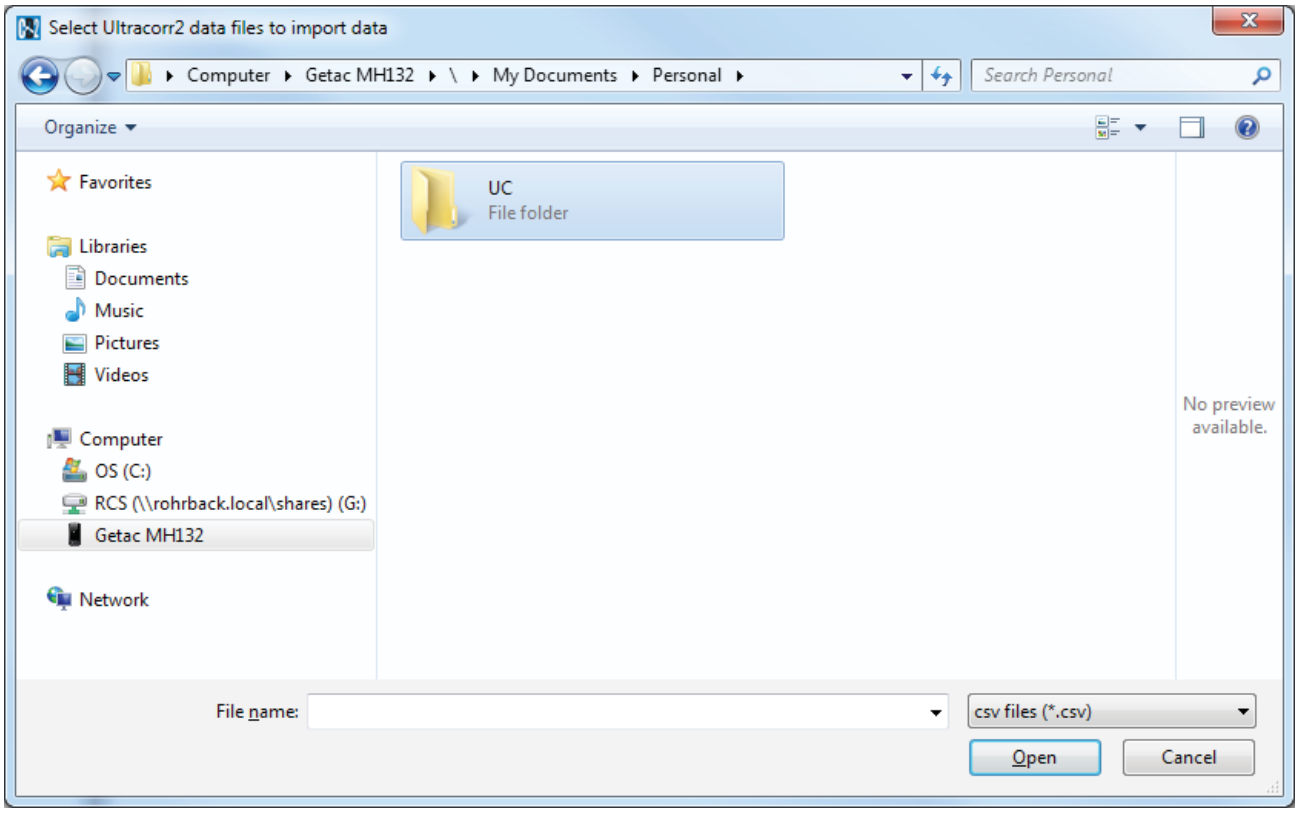


6. Once browsing import, the directory should be browsed to your local drive where files have been copied and not from the SmartPhone.

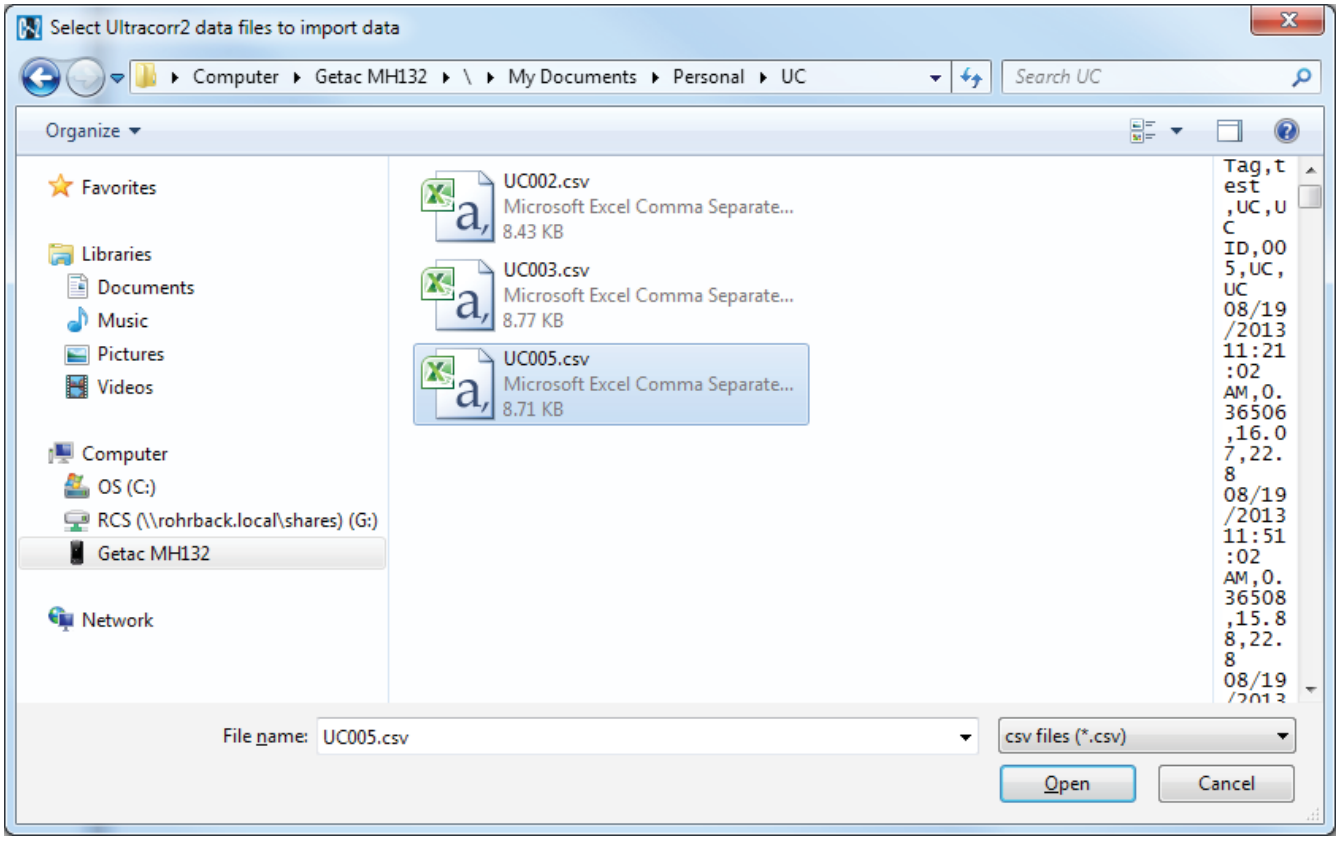



Select Ultracorr2 data files to import data
Computer ▸ Getac MH132 ▸ \ ▸ My Documents ▸
Search My Documents
Organize
Favorites
Libraries
Documents
Music
Pictures
Videos
Computer
OS (C:)
RCS (\\rohrback.local\shares) (G:)
Getac MH132
Network
Business
File folder
My Music
File folder
My Pictures
File folder
My Ringtones
File folder
My Videos
File folder
Personal
File folder
No preview available.
File name:
csv files (*.csv)
Open
Cancel

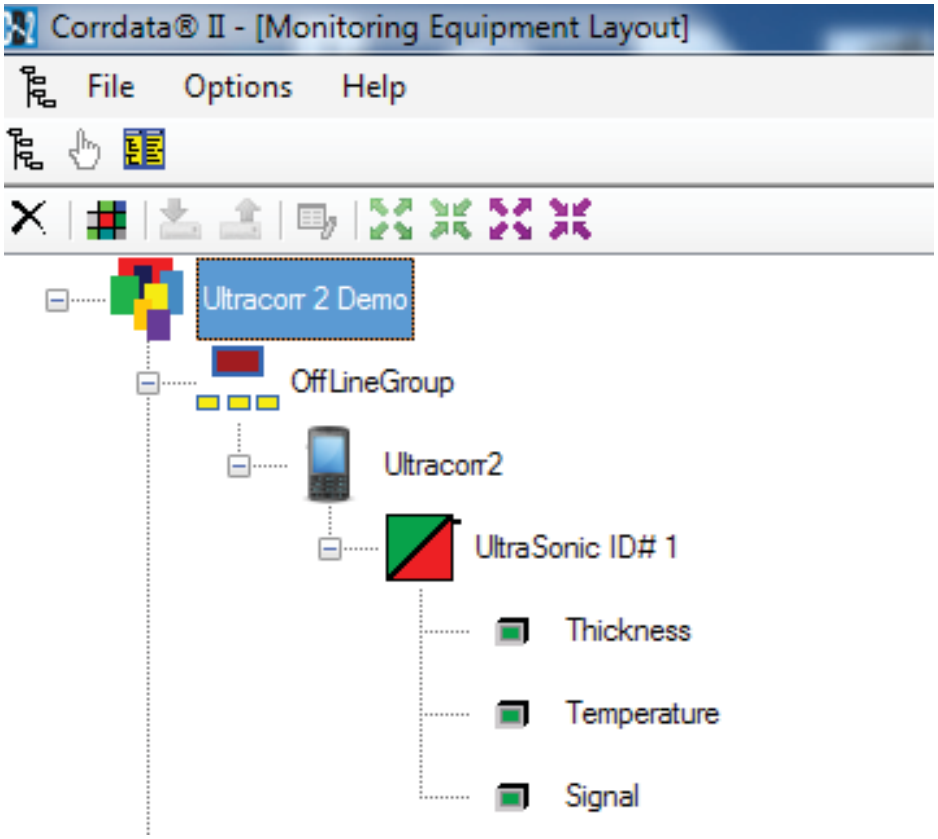

Select Ultracorr2 data files to import data
Computer ▸ Getac MH132 ▸ \ ▸
Search \
Organize
Favorites
Libraries
Documents
Music
Pictures
Videos
Computer
OS (C:)
RCS (\\rohrback.local\shares) (G:)
Getac MH132
Network
Documents and Settings
File folder
Logs
File folder
MUSIC
File folder
My Documents
File folder
Date created: 4/1/2010 7:00 AM
Date modified: 4/1/2010 7:00 AM
Program F
File folder
Temp
File folder
No preview available.
File name:
csv files (*.csv)
Open
Cancel



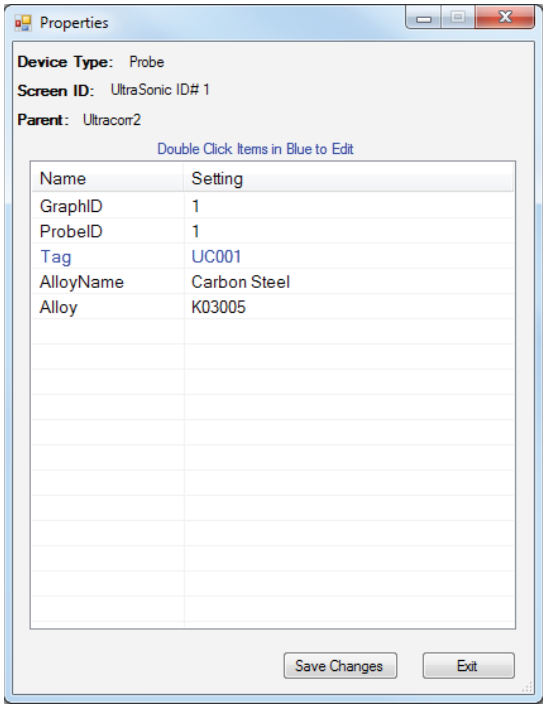
7. Select the file ID that correctly matches the created point and click Open.



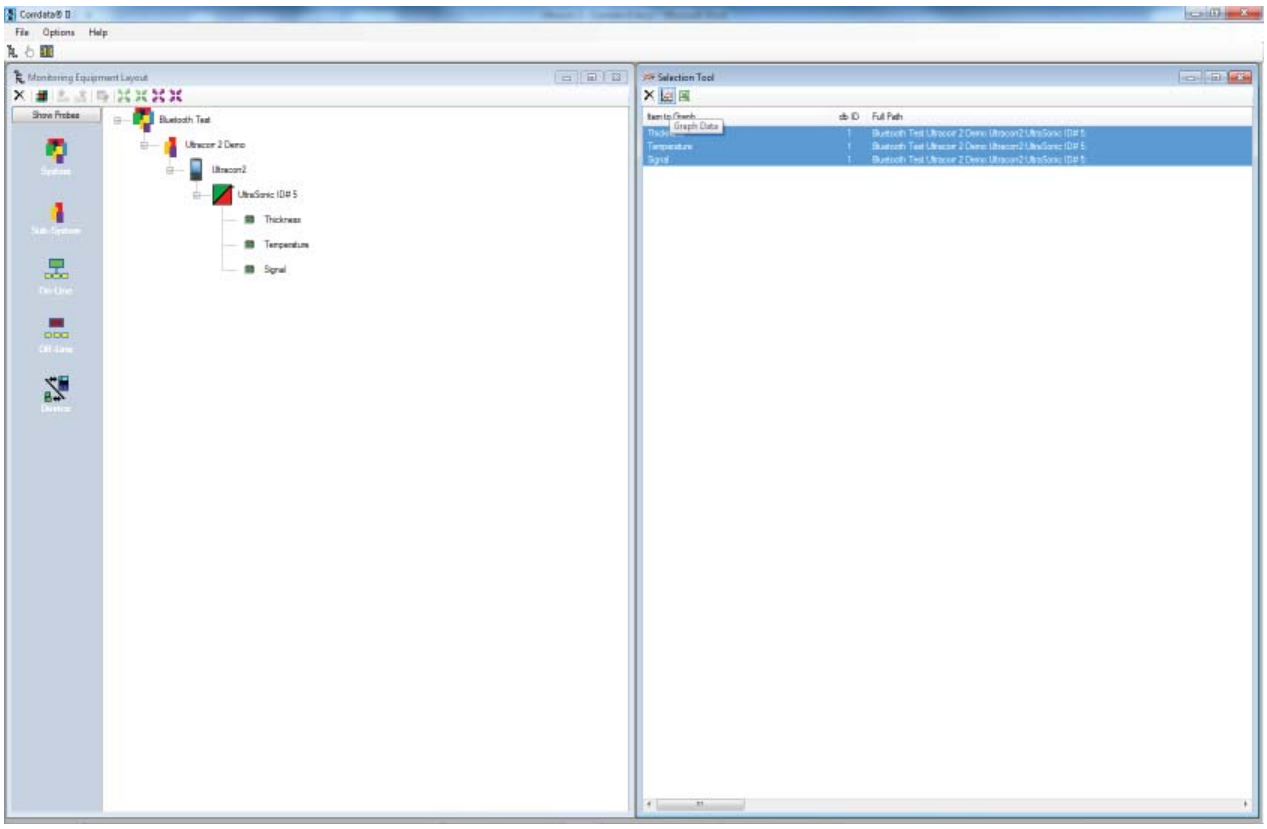
8. Transducer data should now be imported successfully



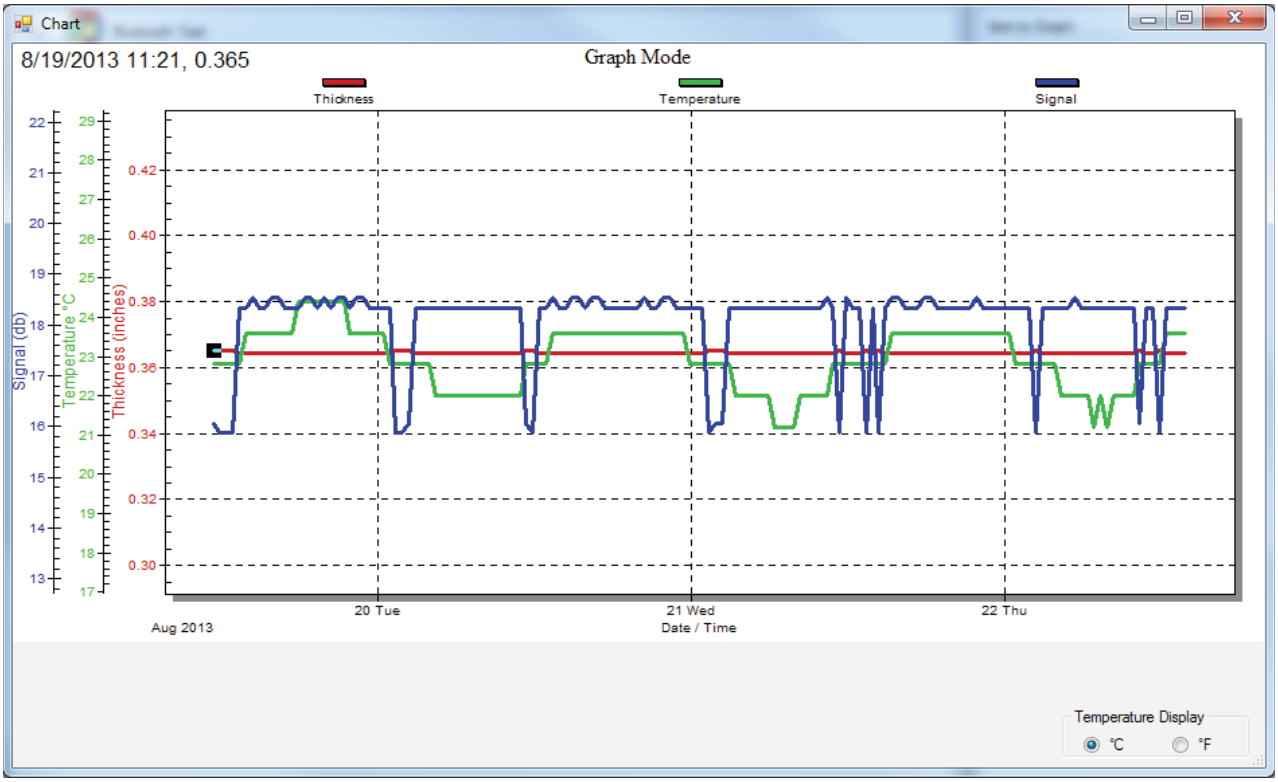
9. Right-click on probe, once data has been imported to verify ID, Tag and Alloy are correct.



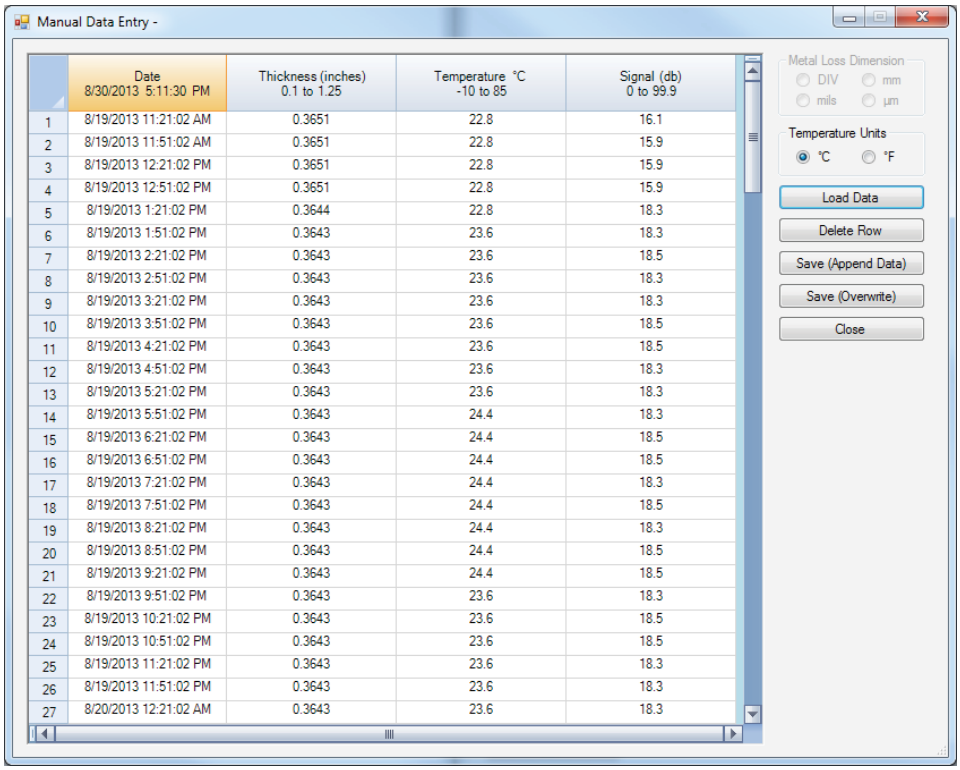
10. Drag the Probe from the Equipment Layout to the Selection Tool. The parameters should be copied into the Selection Tool allowing for graphing. of Data.



11. The parameters can be overlayed or plotted individually.



12. Right-clicking on probe and selecting Data Entry (Manual) will allow you to see the raw data. Load Data must be clicked to refresh data from database.

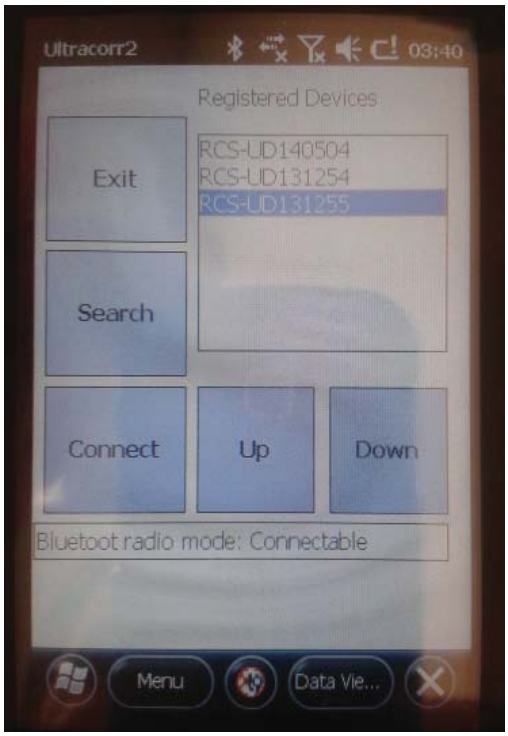


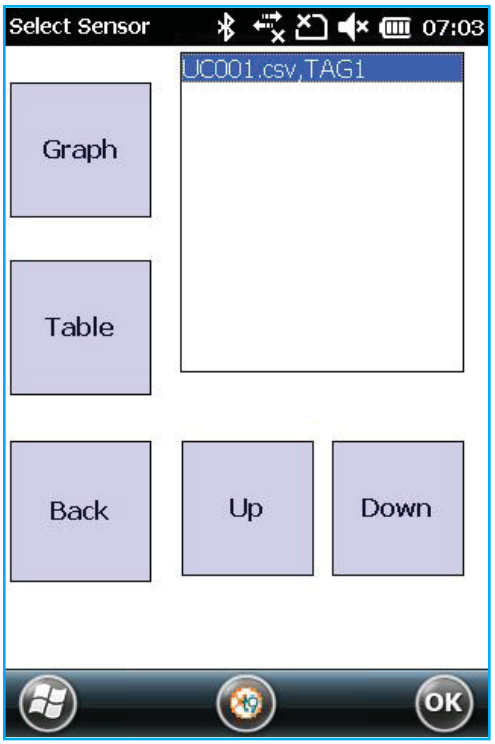
	Date 8/30/2013 5:11:30 PM	Thickness (inches) 0.1 to 1.25	Temperature °C -10 to 85	Signal (db) 0 to 99.9
1	8/19/2013 11:21:02 AM	0.3651	22.8	16.1
2	8/19/2013 11:51:02 AM	0.3651	22.8	15.9
3	8/19/2013 12:21:02 PM	0.3651	22.8	15.9
4	8/19/2013 12:51:02 PM	0.3651	22.8	15.9
5	8/19/2013 1:21:02 PM	0.3644	22.8	18.3
6	8/19/2013 1:51:02 PM	0.3643	23.6	18.3
7	8/19/2013 2:21:02 PM	0.3643	23.6	18.5
8	8/19/2013 2:51:02 PM	0.3643	23.6	18.3
9	8/19/2013 3:21:02 PM	0.3643	23.6	18.3
10	8/19/2013 3:51:02 PM	0.3643	23.6	18.5
11	8/19/2013 4:21:02 PM	0.3643	23.6	18.5
12	8/19/2013 4:51:02 PM	0.3643	23.6	18.3
13	8/19/2013 5:21:02 PM	0.3643	23.6	18.3
14	8/19/2013 5:51:02 PM	0.3643	24.4	18.3
15	8/19/2013 6:21:02 PM	0.3643	24.4	18.5
16	8/19/2013 6:51:02 PM	0.3643	24.4	18.5
17	8/19/2013 7:21:02 PM	0.3643	24.4	18.3
18	8/19/2013 7:51:02 PM	0.3643	24.4	18.5
19	8/19/2013 8:21:02 PM	0.3643	24.4	18.3
20	8/19/2013 8:51:02 PM	0.3643	24.4	18.5
21	8/19/2013 9:21:02 PM	0.3643	24.4	18.5
22	8/19/2013 9:51:02 PM	0.3643	23.6	18.3
23	8/19/2013 10:21:02 PM	0.3643	23.6	18.5
24	8/19/2013 10:51:02 PM	0.3643	23.6	18.5
25	8/19/2013 11:21:02 PM	0.3643	23.6	18.3
26	8/19/2013 11:51:02 PM	0.3643	23.6	18.3
27	8/20/2013 12:21:02 AM	0.3643	23.6	18.3

CHAPTER 9

Data Viewing on Ultracorr2

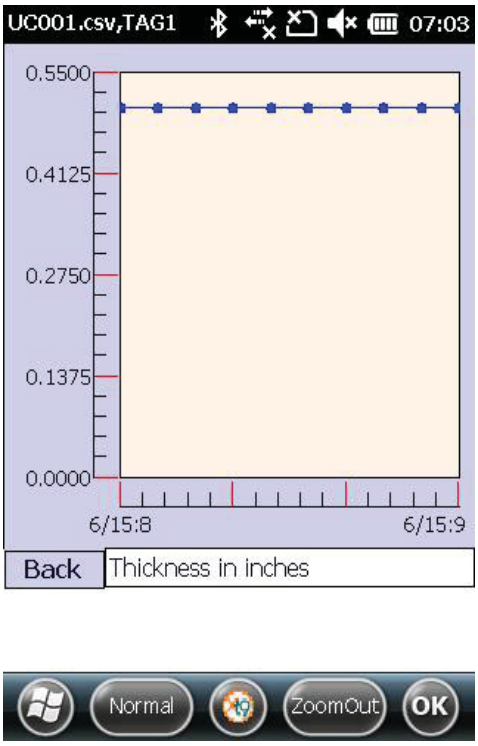
The Ultracorr2 software package allows users to view and plot data. Users can do basic analysis in the field utilizing this tool.

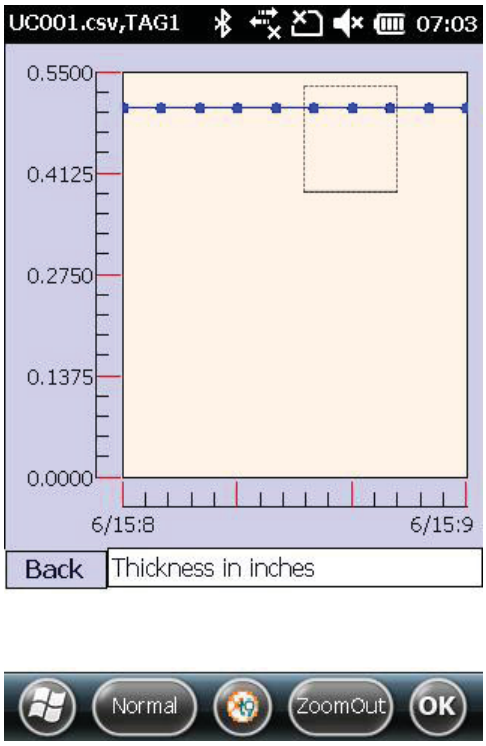




Press **Data View**, and use the **UP**/**Down** to select the file you wish to view

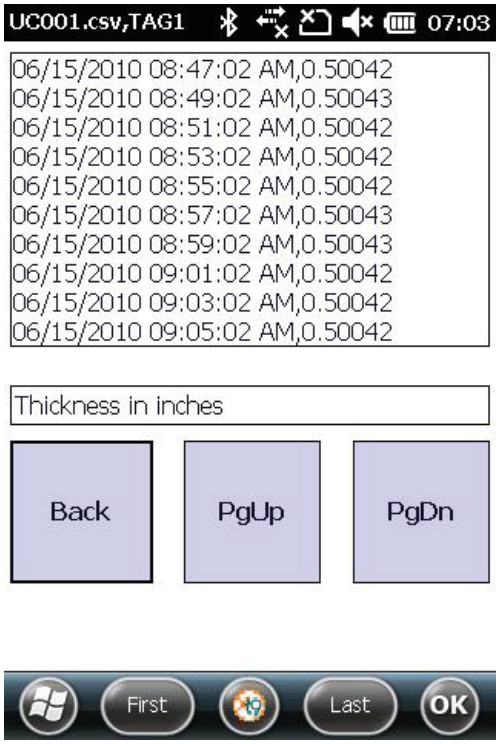
Graph View





Click and drag around the area you want to zoom in

Table View



On table view mode the data is arranged by date (Month/day/Year), time and thickness (inches)

APPENDIX A

Manufacturer's Declaration of Conformity

Product Name: ULTRACORR2 Ultrasonic Transmitter
Model: ULTRACORR2

Approved Manufacturing Location
Rohrback Cosasco Systems, Inc. — Santa Fe Springs, California USA

European Union (EU) Directives

ATEX Certification

Sira 12ATEX2083X
II 2G
Ex ib IIC T4 Gb
Ta = -40°C to +70°C
For use only with AA Lithium cells: P/N 095818

ATEX Directive 94/9/EC

The ULTRACORR2 complies with the European ATEX Directive and the following standards:

IEC 60079-0:2011 Ed. 6, Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements

EC 60079-11:2011-06 Ed. 6, Electrical Apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety " i "

The ULTRACORR2 complies with the European EMC Directive and the following standards:

EN 61326:2006, Electrical Equipment for Measurement and Control
EN 61000-4-2:2008, EMC: Electrostatic Discharge Immunity
EN 61000-4-3:2006, A1:2008, EMC: Radiated Radio Frequency Immunity
EN 61000-4-4:2004, Electrical Fast Transient Immunity
EN 61000-4-6:2004, Conducted RF Immunity
EN55011:2009, A1:2010 (CISPR 11:2009, A1:2010), EMC, Industrial, scientific and medical devices – Limits and methods of measurement.

IEC Ex Certification

Sira IECEx SIR 12.0028X
Ex ib IIC T4 Gb
Ta = -40°C to +70°C
For use only with AA Lithium cells: P/N 095818

The ULTRACORR2 complies with the following IEC standards:

IEC 60079-0:2011 Ed. 6, Electrical Apparatus for Explosive Atmospheres - Part 0: General Requirements

EC 60079-11:2011-06 Ed. 6, Electrical Apparatus for Explosive Atmospheres - Part 11: Equipment protection by Intrinsic Safety " i "

CSA International (CSA) Certification

The ULTRACORR2 has been examined and tested to determine that the design meets basic electrical, mechanical and fire protection requirements by CSA, a Nationally Recognized Testing Laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

North American Certifications

Ex ib IIC T4: Class I, Zone 1 AEx ib IIC T4
For use only with AA Lithium cells: P/N 095818

The ULTRACORR2 complies with the following North American standards:

CSA C22.2 No. 0-10, General Requirements – Canadian Electrical Code, Part II

CAN/CSA-C22.2 No. 60079-0:11, Explosive atmospheres — Part 0: Equipment — General requirements

CAN/CSA-C22.2 No. 60079-11:11, Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i"

ANSI/ISA-60079-0 (12.00.01)-2009, Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements

ANSI/ISA-60079-11 (12.02.01)-2011, Electrical apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety "i"

Federal Communications Commission (FCC) and Industry Canada (IC)

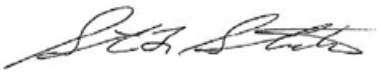
This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation of 20 cm from all persons.

Telecommunication Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the radio frequency (RF) spectrum. Nearly every country requires this type of product certification. RCS is working with governmental agencies around the world to supply fully compliant products and to remove the risk of violating country directives or laws governing wireless device usage.

Place and Date of Issue:

October 17, 2012
RohrbackCosasco Systems, Inc.
Santa Fe Springs, CA 90670

Authorized Signature: 
Steven L. Stricklin Quality Assurance Manager

Certificate: 2524043 **Master Contract:** 252069
Project: 70001363 **Date Issued:** July 17, 2013

equipment where a charge-generating mechanism (such as wind-blow dust) is unlikely to be present. Refer to user instructions for further information.
3) Under this certification, the UST2 Ultrasonic Transducer shall be connected to the ULTRACORR-2 as the single source for power.
4) The installation of the UST2 Ultrasonic Transducer to the intrinsically safe ULTRACORR-2 circuit shall comply with Article 504.30 (A) of NFPA 70 and Clause F6.1 of CSA C22.1.
5) The wiring between the UST2 Ultrasonic Transducer and the ULTRACORR-2 circuit shall have an external minimum insulation thickness of 0.8 mm.

Model ULTRACORR-2 portable battery supply/transmitter: intrinsically safe only when powered by two non-rechargeable, AA-size cells having part number 095818 or 095820 as specified in drawing number 725126. Output entity parameters: Uo = 126 Vac, Io = 60 mA, Po = 173 mW, Co = 2.79 nF, Lo = 9876 µH; -40ºC ≤ Tamb ≤ +70ºC.

Notes:

1) The cells in the ULTRACORR-2 battery pack are intrinsically safe and may be replaced by the user, however, only Rohrback Cosasco Systems (RCS) P/N 095818 or 095820 cells supplied by RCS may be used; in addition, provided care is taken to prevent the cells being damaged, they may be changed whilst in the hazardous area. Cells with P/N 095820 are also compatible with units certified under previous issues of the certificate.
2) The ULTRACORR-2 contains a voltage-enhancing step-up transformer circuit clamped to 126 Vac by Zener diodes and used to activate the piezoelectric crystal.

APPLICABLE REQUIREMENTS

CSA C22.2 No. 0-10	General Requirements – Canadian Electrical Code, Part II
CAN/CSA-C22.2 No. 60079-0:11	Explosive atmospheres — Part 0: Equipment — General requirements
CAN/CSA-C22.2 No. 60079-11:11	Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i"
ANSI/ISA-60079-0 (12.00.01)-2009	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements
ANSI/ISA-60079-11 (12.02.01)-2011	Electrical apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety "i"

MARKINGS

Product markings shall be in accordance with the related standards. In addition, it shall be the responsibility of the manufacturer to provide additional markings on the product to comply with the requirements of the local regulatory authorities. Example, for products intended for use in Canada, any caution and warning markings must be provided in French and English per CSA C22.2 No. 0-10, clause 6.3.1.

The following markings for each unit shall appear on a c-CSA-us Accepted OR c-UL-us Recognized adhesive label, which is suitable for indoor or outdoor use on plastic, at a maximum service temperature of 80°C or higher. The label stock shall be printed with one of the approved printer and ink combinations as specified in the manufacturers listing (Refer to drawing 646129-2 and 725125-2):

- Manufacturer's name "Rohrback Cosasco Systems, Inc", "Rohrback Cosasco Systems" or CSA Master Contract Number "252069", adjacent to the CSA Mark in lieu of Manufacturer's name.

Certificate: 2524043 **Master Contract:** 252069
Project: 70001363 **Date Issued:** July 17, 2013

- Model number: as specified in the PRODUCTS section, above.
- Electrical ratings/ Entity Parameters: As specified in the PRODUCTS section, above.
- Ambient temperature rating: as specified in the PRODUCTS section, above (may be abbreviated).
- Manufacturing date in MMYY format, or serial number, traceable to month of manufacture.
- The CSA Mark, as shown on page 1 of the Certificate of Conformity.
- Hazardous Location designation: as specified in the PRODUCTS section, above.
- Temperature Code: as specified in the PRODUCTS section, above.
- "Exib" (shall appear on the product)
- "INTRINSICALLY SAFE"
- "WARNING - NO LIVE MAINTENANCE"
- "12.2524043" (Certificate number) adjacent to the CSA Monogram

CSA Group

Supplement to Certificate of Compliance

Certificate: 2524043 **Master Contract:** 252069

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70001363	July 17, 2013	Update to report 2524043 to include new battery pack 095820 for ULTRACORR-2 and for UST2 : Mechanical changes; modification of Ci ; deletion of routine dielectric strength test.
2569040	December 11, 2012	Update to report 2524043 to include drawing revisions for the addition of a Warning equipment service note on two labels.
2524043	August 3, 2012	Original Certification of the Model UST2 Ultrasonic Transducer and the Model ULTRACORR-2 portable battery supply/transmitter.

IEC Ex Certification - Ultracorr2 Ultrasonic Transmitter

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx SIR 12.0028X issue No.:1

Certificate history:
Issue No. 1 (2013-4-23)
Issue No. 0 (2012-4-20)

Status: **Current**

Date of Issue: **2013-04-23** Page 1 of 5

Applicant: **Rohrback Cosasco Systems**
11841 East Smith Ave
Santa Fe Springs
California
90670
United States of America

Electrical Apparatus: **ULTRACORR-2 Ultrasonic Transmitter**
Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking: Ex ib IIC T4 Gb
Ta = -40°C to +70°C

Approved for issue on behalf of the IECEx Certification Body: A C Smith

Position: Certification Manager

Signature: (for printed version)

Date: 2013-04-23

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom

sira CERTIFICATION

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0028X

Date of Issue: **2013-04-23** Issue No.: **1**

Manufacturer: **Rohrback Cosasco Systems**
11841 East Smith Ave
Santa Fe Springs
California
90670
United States of America

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/SIR/ExTR12.0084/00 GB/SIR/ExTR13.0077/00

Quality Assessment Report:

US/UL/QAR08.0005/02 US/UL/QAR08.0005/03

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0028X

Date of Issue: **2013-04-23** Issue No.: **1**

Page 3 of 5

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The ULTRACORR-2 is battery-powered, portable instrument that measures pipe and vessel wall thickness for non-intrusive corrosion and erosion monitoring. The instrument is intended for connection to a piezo-electric ultrasonic transducer manufactured by Rohrback Cosasco Systems, typically a model UST2, which provides periodic time- and date-stamped measurements of wall thickness. The ULTRACORR-2 sends the results via a low power wireless channel to a remote device.
The ULTRACORR-2 is powered from two, non-rechargeable, AA cells, which are intrinsically safe and may be replaced in the hazardous area. Only cells with part number 095818 or 095820 from Rohrback Cosasco Systems may be fitted. Apart from the cells, the circuitry is completely encapsulated within a plastic enclosure. A flying lead terminates in a plug-and-socket connector, which is used to connect the ULTRACORR-2 to the ultrasonic transducer.
See Equipment Continued for additional description.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. The cells in the battery pack are intrinsically safe and may be replaced by the user, however, only RCS P/N 095818 or 095820 cells supplied by Rohrback Cosasco Systems may be used; in addition, provided care is taken to prevent the cells being damaged, they may be changed whilst in the hazardous area. Cells with P/N 095820 are also compatible with units certified under previous issues of the certificate.

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0028X

Date of Issue: **2013-04-23** Issue No.: **1**

Page 4 of 5

EQUIPMENT(continued):

For the purposes of the assessment of external equipment, the following worst case parameters may be used. Note: Uo, cannot occur at the same time as the Io and Po.

	Combined parameters
Uo	126 V ac
Io	60 mA
Po	173 mW
Ci	2.42 nF
Li	0
Co	2.79 nF
Lo	9876 µH

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0028X

Date of Issue: **2013-04-23** Issue No.: 1

Page 5 of 5

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1 – this Issue introduced the following change:	
1.	The 095820 battery pack was introduced and recognised in the Product Description and Conditions of Certification. Whilst this is a direct replacement for the original, 095818 battery pack for the purpose of back compatibility, reference to the 095818 battery pack will be retained in the certificate.

IEC Ex Certification - UST2 Ultrasonic Transducer

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx SIR 12.0029X issue No.:2	Certificate history: Issue No. 2 (2013-4-23) Issue No. 1 (2012-6-13) Issue No. 0 (2012-4-20)
Status:	**Current**	
Date of Issue:	**2013-04-23**	Page 1 of 4
Applicant:	**Rohrback Cosasco Systems** 11841 East Smith Ave Santa Fe Springs California 90670 **United States of America**	
Electrical Apparatus: *Optional accessory:*	**UST2 Ultrasonic Transducer**	
Type of Protection:	**Intrinsic Safety**	
Marking:	Ex ia IIC T4 Gb Ta = - 40°C to + 70°C	
Approved for issue on behalf of the IECEx Certification Body:	A C Smith	
Position:	Certification Manager	
Signature: *(for printed version)*		
Date:	2013-04-23	

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

SIRA Certification Service
Rake Lane
Eccleston
Chester
CH4 9JN
United Kingdom

sira CERTIFICATION

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0029X

Date of Issue: **2013-04-23** Issue No.: **2**

Page 2 of 4

Manufacturer:

Rohrback Cosasco Systems
11841 East Smith Ave
Santa Fe Springs
California
90670
United States of America

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
GB/SIR/ExTR12.0085/00 GB/SIR/ExTR12.0085/01 GB/SIR/ExTR13.0044/00

Quality Assessment Report:

US/UL/QAR08.0005/02 US/UL/QAR08.0005/03

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0029X

Date of Issue: **2013-04-23** Issue No.: **2**

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The UST2 is a piezo-electric ultrasonic transducer that is designed to be attached by adhesive to a metal pipe, for measuring metal thickness. It is equipped with an integral RTD for temperature monitoring and contains an embedded memory chip inside its connector to retain user-configured ID characteristics. It is intended to be periodically interrogated by a monitoring device; this may be an ULTRACORR-2, IECEx SIR.12.0028X, manufactured by Rohrback Cosasco Systems, alternatively, another appropriately certified device may be used provided it is suitable for the application and has matching entity parameters.

The high voltage supply to the piezo-electric transducer and the low voltage supply to the RTD are treated as a single intrinsically safe circuit with the following combined entity parameters:

	Combined parameters
Ui	126 V ac
Ii	60 mA
Pi	173 mW
Ci	0.85 nF
Li	0

CONDITIONS OF CERTIFICATION: YES as shown below:

1. The UST2 has been assessed as compliant for a T4 temperature class at an upper ambient temperature of 70°C. It has also been assessed with the front face attached to a process pipe up to 150°C provided that the cable end of the UST2 is at no more than 70°C. However, it should be noted that in this condition, with a pipe surface temperature at 150°C, the pipe surface itself limits the temperature class to T3.
2. The metallic ring on the top of the enclosure may store a level of electrostatic charge that could become incendive. Therefore, the user/installer shall implement precautions to prevent the build-up of electrostatic charge e.g. locate the equipment where a charge-generating mechanism (such as wind-blow dust) is unlikely to be present. Refer to user instructions for further information.
3. Only portable, battery-powered equipment, with no connection to earth, can be connected to the UST2. The Rohrbach-Cosasco Systems Ultracorr (IECEx SIR 12.0028) is suitable equipment.

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 12.0029X

Date of Issue: **2013-04-23** Issue No.: **2**

Page 4 of 4

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1 – this Issue introduced the following change:	
1	ExTR Free Ref. no. R27101B/01 replaced R27101B/00
Issue 2 – this Issue introduced the following changes:	
1	Mechanical changes, including a thinner diaphragm were approved.
2	A change to Ci in the entity parameters from 1 nF to 0.85 nF, the table above is amended accordingly.
3	Minor changes to the artwork were acknowledged.
4	The addition of a new Condition of Certification and the removal of the Condition of Manufacture.

ATEX Certification - Ultracorr2 Ultrasonic Transmitter

sira CERTIFICATION

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 12ATEX2083X** Issue: **1**

4 Equipment: **ULTRACORR-2 Ultrasonic Transmitter**

5 Applicant: **Rohrback Cosasco Systems**

6 Address: 11841 East Smith Ave
Santa Fe Springs
California
90670
USA

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

IEC 60079-0:2011 Ed. 6 IEC 60079-11:2011 Ed. 6

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2G
Ex ib IIC T4 Gb
Ta = -40°C to +70°C

Project Number 29789

A C Smith
Certification Manager

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
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Fax: +44 (0) 1244 681330
Email: info@siracertification.com

Form 9400 Issue 2

sira CERTIFICATION

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE **Sira 12ATEX2083X**
Issue 1

13 **DESCRIPTION OF EQUIPMENT**

The ULTRACORR-2 is battery-powered, portable instrument that measures pipe and vessel wall thickness for non-intrusive corrosion and erosion monitoring. The instrument is intended for connection to a piezo-electric ultrasonic transducer manufactured by Rohrback Cosasco Systems, typically a model UST2, which provides periodic time- and date-stamped measurements of wall thickness. The ULTRACORR-2 sends the results via a low power wireless channel to a remote device.

The ULTRACORR-2 is powered from two, non-rechargeable, AA cells, which are intrinsically safe and may be replaced in the hazardous area. Only cells with part number 095818 or 095820 from Rohrback Cosasco Systems may be fitted. Apart from the cells, the circuitry is completely encapsulated within a plastic enclosure. A flying lead terminates in a plug-and-socket connector, which is used to connect the ULTRACORR-2 to the ultrasonic transducer.

For the purposes of the assessment of external equipment, the following worst case parameters may be used. Note: Uo, cannot occur at the same time as the Io and Po.

	Combined parameters
Uo	126 V ac
Io	60 mA
Po	173 mW
Ci	2.42 nF
Li	0
Co	2.79 nF
Lo	9876 µH

Variation 1 - This variation introduced the following changes:

i. The 095820 battery pack was introduced and recognised in the Product Description and the Special Condition for Safe Use. Whilst this is a direct replacement for the original 095818 battery pack, for the purpose of back compatibility, reference to the 095818 battery pack will be retained in the certificate.

14 **DESCRIPTIVE DOCUMENTS**

14.1 **Drawings**

Refer to Certificate Annexe.

14.2 **Associated Sira Reports and Certificate History**

Issue	Date	Report no.	Comment
0	20 April 2012	R27101A/00	The release of the prime certificate.
1	04 April 2013	R29789A/00	The introduction of Variation 1.

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
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sira CERTIFICATION

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 12ATEX2083X
Issue 1

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

15.1 The cells in the battery pack are intrinsically safe and may be replaced by the user, however, only RCS P/N 095818 or 095820 cells supplied by Rohrback Cosasco Systems may be used; in addition, provided care is taken to prevent the cells being damaged, they may be changed whilst in the hazardous area. Cells with P/N 095820 are also compatible with units certified under previous issues of the certificate.

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
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Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com

Certificate Annexe

Certificate Number: **Sira 12ATEX2083X**

Equipment: **ULTRACORR-2 Ultrasonic Transmitter**

Applicant: **Rohrback Cosasco Systems**

sira CERTIFICATION

Issue 0

Drawing no.	Sheets	Rev.	Date (Sira stamp)	Title
725121	1 of 1	-	04 Apr 12	Parts list
725123	1 to 13	A	04 Apr 12	Artwork
725124	1 to 2	-	04 Apr 12	Schematic
725125 -1	1 of 1	-	04 Apr 12	Marking
725126	1 to 2	-	04 Apr 12	General assembly
725127	1 of 1	-	04 Apr 12	Sector diagram

Issue 1

Drawing no.	Sheets	Rev.	Date (Sira stamp)	Title
725125 - 1	1 of 1	A	13 Mar 13	Marking
725126	1 to 2	A	13 Mar 13	General assembly

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330

Form 9400 Issue2

ATEX Certification - UST2 Ultrasonic Transducer

sira CERTIFICATION

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 12ATEX2084X** Issue: **2**

4 Equipment: **UST2 Ultrasonic Transducer**

5 Applicant: **Rohrback Cosasco Systems**

6 Address: 11841 East Smith Ave
Santa Fe Springs
California
90670
USA

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

IEC 60079-0:2011 IEC 60079-11:2011

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2G
Ex ia IIC T4 Gb
Ta = -40°C to +70°C

Project Number 29833

A C Smith
Certification Manager

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
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Form 9400 Issue 2

sira CERTIFICATION

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE **Sira 12ATEX2084X**
Issue 2

13 **DESCRIPTION OF EQUIPMENT**

The UST2 is a piezo-electric ultrasonic transducer that is designed to be attached by adhesive to a metal pipe, for measuring metal thickness. It is equipped with an integral RTD for temperature monitoring and contains an embedded memory chip inside its connector to retain user-configured ID characteristics. It is intended to be periodically interrogated by a monitoring device; this may be an ULTRACORR-2, Sira 12ATEX2083X, manufactured by Rohrback Cosasco Systems, alternatively, another appropriately certified device may be used provided it is suitable for the application and has matching entity parameters.

The high voltage supply to the piezo-electric transducer and the low voltage supply to the RTD are treated as a single, intrinsically safe circuit with the following combined entity parameters:

	Combined parameters
Ui	126 V ac
Ii	60 mA
Pi	173 mW
Ci	0.85 nF
Li	0

14 **DESCRIPTIVE DOCUMENTS**

14.1 **Drawings**

Refer to Certificate Annexe.

14.2 **Associated Sira Reports and Certificate History**

Issue	Date	Report no.	Comment
0	20 April 2012	R27101B/00	The release of the prime certificate.
1	6 June 2012	R27101B/01	Report no. R27101B/01 replaced R27101B/00 to allow the specification of the insulation material around the piezo transducer to be more generic.
2	20 February 2013	R29833A/00	It was recognised that the manufacturer has not made any UST2 devices in accordance with the design covered by Issues 0 and 1. It is therefore their intention to replace this model with the one introduced by Issue 2, also known as the UST2, which incorporates the following design modifications: i. The approval of mechanical changes, including a thinner diaphragm. ii. The entity parameter Ci was changed from 1 nF to 0.85 nF. iii. Minor changes to the artwork were acknowledged. iv. The Description, Special Conditions for Safe Use and Conditions of Certification were revised so that they apply specifically to the new model design.

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
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Fax: +44 (0) 1244 681330

sira CERTIFICATION

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE **Sira 12ATEX2084X**
Issue 2

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

15.1 The UST2 has been assessed as compliant for a T4 temperature class at an upper ambient temperature of 70°C. It has also been assessed with the front face attached to a process pipe up to 150°C provided that the cable end of the UST2 is at no more than 70°C. However, it should be noted that in this condition, with a pipe surface temperature at 150°C, the pipe surface itself limits the temperature class to T3.

15.2 The metallic ring on the top of the enclosure may store a level of electrostatic charge that could become incendive. Therefore, the user/installer shall implement precautions to prevent the build-up of electrostatic charge e.g. locate the equipment where a charge-generating mechanism (such as wind-blown dust) is unlikely to be present. Refer to user instructions for further information.

15.2 Only portable, battery-powered equipment, with no connection to earth, can be connected to the UST2. The Rohrbach-Cosasco Systems Ultracorr (Sira 12ATEX2083) is suitable equipment.

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

This certificate and its schedules may only be reproduced in its entirety and without change.

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Tel: +44 (0) 1244 670900
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Certificate Annexe

Certificate Number: **Sira 12ATEX2084X**

Equipment: **UST2 Ultrasonic Transducer**

Applicant: **Rohrback Cosasco Systems**

sira CERTIFICATION

Issues 0 and 1 The drawings listed with these Issues were rationalised and have been superseded by those detailed in Issue 2

Issue 2

Drawing no.	Sheets	Rev.	Date (Sira stamp)	Title
646129 -1	1 of 1	-	04 Apr 12	UST2 IECEx & ATEX marking
646131	1 to 7	B	11 Feb 13	UST2 PCB artwork
646132	1 of 1	A	11 Feb 13	UST2 schematic and parts list
646133	1 to 2	B	19 Feb 13	UST2 general assembly

This certificate and its schedules may only be reproduced in its entirety and without change.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900